CHEMICAL MARKETS

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When a Fellow Needs a Friend

AFTER having kicked the tariff all over the back-lot, our distinguished lawmakers in Washington, have turned their attention once more to another old favorite of theirs, prohibition. And once more, if the sincerity of their consideration of this problem is granted, the consistency of their blinking at obvious facts is ridiculous.

IN the first place, they ignore completely that in legislating against a source of supply, there is the factor of demand to be considered, which cannot be abolished by Act of Congress. They forget that, law or no law, whenever there is a sufficient demand, there always has been a supply to meet this demand. Supply and demand are subservient only to natural economic laws and not to forced political legislation.

IN the second place, the enforcement of prohibition as practiced in this country for the past ten years has created such a fertile source of political patronage, that a tremendous barrier to a change of any sort has been erected. The graft involved in the present prohibition enforcement has become firmly imbedded in local politics, so that, although a majority of thinking Americans are convinced of the impracticability of enforcement, its present unsatisfactory status is completely satisfactory to the local politicians upon whose acquiescence any change would of necessity depend.

UNFORTUNATELY for the alcohol industry, demand for alcohol as an antifreeze and for industrial purposes is not so insatiable or so fixed but what the legitimate user, if he continues to be harassed, will not find substitutes. With the law openly broken, smuggling and the illegitimate manufacture of alcohol from half a dozen different raw materials going on on all sides, the legitimate user has ample cause to feel abused, when anyone with a pencil and paper can figure how infinitesimal is the alcohol diverted as compared with the quantity consumed for beverage purposes. And still the representatives of the people in Washington refuse to face the facts, and, in an effort to adjust himself to their antics, the legitimate user of alcohol is forced to run madly to get nowhere like a squirrel in a cage.

"See American First"

PROBABLY few, if any, users of your product ever visit your plant. But if they should do so, and observed there the use of "American" Alcohol, it would be a point in your favor. For "American" Alcohol has established a reputation for high uniform excellence.

This fine quality is based upon several significant factors . . . an exclusive process of distillation originated in our laboratories . . . a number of large, completely equipped producing plants . . . and strict technical control of all processes.

"See American First" for good Alcohol.

This is number 13 of a series depicting historical periods in the development of America

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Plants:

Pekin, Ill. Gretna, La. Philadelphia, Pa. Sausalito, Cal.

THE Mississippi River Steamboat, in retrospect, is the romantic symbol of the tremendous development of the mid-west and southwest. The first of these boats was built in 1811—an adaptation of Robert Fulton's "Clermont". This type proved impracticable for shallow, tortuous channels, so Henry M. Shreve evolved the successful light draft, stern wheel steamer. The fame of one river pilot still endures — that of the immortal "Mark Twain".

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1929—Year of Mergers

The past year will go down in the history of the American chemical industry as "the year of mergers." There have been many mergers before in the chemical industry and, in fact, from its very infancy, the industry has shown the way in consolidations and large unit production. But never before has any single twelve-months period been characterized by such an overwhelming manifestation of consolidation as has 1929.

The evolution of the chemical merger is interesting not only as depicting the changing business psychology, but also as reflecting newer legal aspects and the development of modern financing methods.

The first step towards chemical consolidations on the modern scale was initiated by Dr. William H. Nichols in 1899 with the formation of the General Chemical Company out of eight smaller chemical companies operating a dozen sulfuric acid plants. In this case the merger method was simple and direct. A fair value was placed upon each of the eight companies, this value was discounted twenty per cent, and each of the eight companies given that pro rata share of stock, in the new organization in which they completely lost their identity.

In 1920, the Allied Chemical & Dye Corporation was incorporated as a holding company to acquire all of the capital stock of General, Solvay Process, Semet-Solvay, Barrett, and National Aniline. This marked the second stage in the development of chemical mergers. In this case, the constituent companies did not lose their identity. They continued to operate independently, but under the general supervision of the holding company which had purchased control of each. No public financing was involved.

During the past year, the third and most recent phase of the chemical merger has been unfolded. Practically all of the consolidations during 1929 were consumated by the parent company buying the assets of the new acquisition with cash secured usually from the public sale of preferred stock. Here again, the merged companies continue to operate independently, but with distinct economies resulting in sales and distribution costs. Most significant in this third stage is the public financing of the merger and the fact that the merger is secured through the purchase of the *assets* of the company to be acquired and not the company itself. The purpose is also changed from a combination of similar producers to a group of diverse chemical lines.

Whether or not this latter method is here to stay is rather to be doubted. In each case, the method used has been adopted to the needs of the times. It has never been possible arbitrarily to chose a method but rather has it been necessary carefully to study the legal and financial conditions of the particular period and adopt the method to that. During the past "year of mergers," the chemical industry has made a new contribution to the changing structure of industry, in addition to the technico-economic contributions in its own particular sphere.

Lowering Prices

Conspicuous reductions in price, the result of technical advance, have been a distinguishing feature of chemical price history during the past three or four years. In fact, technical advances—in improved manufacturing operations, in the use of cheaper, more available raw materials, in the production of new chemical products—have been of late the dominating price influence. It is an influence whose potency promises to become greater rather than less in the immediate future.

What has happened to borax, to ammonia, to methanol, to phenol, to acetone, and several score of the new lacquer solvents and rubber accelerators may within reason be expected to happen to other chemicals. We have pretty definitely passed into one of those periodical periods of great scientific activity in which progress expresses itself very promptly in revolutionary changes in the supply and demand for chemicals. Such an era is most disconcerting to production programs and sales policies. It is a time of inter-product competition that bears hard upon the chemical manufacturer unless he takes his own place in the forward march. But it is an epoch when chemical processes and chemical materials greatly widen the sphere of their influence upon industry. It is therefore, at once a time of stress and of opportunity for the chemical industry.

Quite regardless of the "economic trends" or the "state of general business" we may look forward to a series of lower price levels in chemicals. Not a pleasant prospect for the backward or inefficient producer—but an outlook of rare opportunity for the aggressive companies whose manufacturing and sales departments are supported by research.

Facing the New Year

Mixed trends characterize the chemical markets as they enter into the new year. The past two months have witnessed an appreciable let-down in chemical business and weaknesses in the positions of several chemicals, previously concealed under the tremendous pressure of unsurpassed demand and general prosperity, have now come into the picture with disconcerting suddenness. Chlorine and methanol, to mention only two, are outstanding culprits in this regard. There can be no doubt as to the fact that there is too much of both commodities and many lesser items follow close in their wake.

On the other hand, there are several factors in the market which indicate that "things are not as bad as they seem." Outstanding, perhaps, is the unusually heavy demand for soda ash, which in December exceeded all forecasts, and the fact that contracts for the alkalies generally, are from three to four per cent ahead of this time last year. As the alkali group is usually considered one of the best indicators of general business conditions, this absence of reluctance to do business and make commitments on these materials would seem to show that there is no lack of confidence in the future. Another factor which points to the basically sound position of the chemical markets is that consumers entered the new year with no stocks on hand. All efforts were directed, during the past month, to keeping inventories at a minimum. Renewed buying accordingly bids fair to start immediately and anything like a normal demand should go far towards restoring firmness in all markets.

One thing is certain. Despite the slackening of business during the closing months of the year, 1929 was one of the peak years of chemical business. Now for 1930.

Quotation Marks

We want to build up an organization for spreading knowledge and enthusiasm for the census as a practical useful trade builder to every factory or store, big or small. We want thus to bring home to all the millions who must be asked to fill out census schedules the advantages to them of doing so. We want to impress upon them the absolute necessity, in their own and the public interest, of furnishing complete and accurate information and of doing so with the greatest possible promptness.—*Dr. Julius Klein.*

Ill-considered remedies for our faults bring only penalties after them.—*President Hoover.*

The annual report of the British Sulphate of Ammonia Federation records another general advance in the nitrogen industry for the year ended June 30 last. The chief feature to which attention is drawn is the continued tendency of production to outrun consumption. The increase in production is almost wholly in synthetic forms of nitrogen. For example, while by-product sulfate of ammonia increased last year 8,000 tons, there was an increase on the synthetic product of 118,000 tons, and an increase in other forms of fixed nitrogen of 129,000 tons. If the present proportions of increased production and increased consumption continues—that is, 22½ per cent to 14 per cent—it is obvious what the end must be. No sign, moreover, is yet in sight of consumption catching up with production.—*Chemical Age.*

The falling-off in the export demand for British creosote is already creating difficulties for the tar residuals industry, it being reported that the creosote storage tanks in some parts of the country are almost charged to capacity. With the growing American production of creosote and the tendency to replace timber by steel in railway sleepers there is very little hope of the export demand for creosote rising again to the level it occupied some five or six years ago and the introduction of new and extensive uses for the material would mean a lot to the coal by-products industry. Research towards this objective has been pursued for some time past, but the results so far obtained have not been particularly striking.—*Chemical Trade Journal.*

Ten Years Ago

(From our issues of January 1920)

Dr. Irving Langmuir was awarded the William H. Nichols Medal.

Shawinigan Products Corp. was organized in Manhattan with capital of $200,000 to manufacture carbide, acetic acid and other chemicals. R. E. Dwight, T. A. O Callaghan, and J. B. Breckenridge were the incorporators.

John M. Weiss and C. R. Downs secured three American patents on a new process for making tartaric acid, citric acid and lactic acid from maleic acid made from benzol.

General Chemical Co. and Solvay Process Co. organized the Atmospheric Nitrogen Corp. Officers were elected as follows: president, R. L. Pierce; treasurer, A. W. Hudson; and secretary, Ernest Jones. Directors, R. L. Pierce, H. H. S. Handy, E. L. Miller, W. H. Nichols, Jr., Henry Wigglesworth and Harold Otis.

National Aniline & Chemical Co. transferred Jamaica Bay plant to Hilwalkal Corp. for reported price of $700,000.

Irenee du Pont was elected a director of the Guaranty Trust Co.

John C. Wiarda died aged 59.

Mutual Chemical Co., Baltimore, planned to construct a two-story building at cost of about $80,000.

Victor Chemical Co. planned to build a $700,000 plant near Nashville, Tenn.

American chemical industry passes into a new technico-financial era during 1929

NEW processes, new plants, new mergers indicate during 1929 the beginning of a new economic era for the American chemical industry.

The post-war readjustments are over. The balance has been struck again between production and consumption. Chemical prices are no longer made by distressed sellers, but are once more governed by true costs. Technical skill and efficient management are thus restored to their proper place as the controlling factors in chemical competition.

This readjustment to the new economic conditions has been slowly and painfully accomplished, partly by the scrapping of surplus, war-built plant capacity, partly by consolidations among chemical producers, and in part too, by the growth of chemical consuming industries and by the birth of new consumers in the fields of rayon, lacquers, refrigeration, fertilizers, plastics, the radio and the aeroplane. The modern chemicalization of industry, that is to say, the use of chemical energy and the employment of chemical substitutes for natural raw materials has opened up vast new markets for the chemical manufacturer, new opportunities for the chemical technician. At the threshold of this new industrial phase, the American chemical industry most fortunately finds itself placed ready and able to render the important economic service of supplying modern civilization's insatiable demands for more and better and cheaper raw materials.

Downward Price Trend

Firm prices and the increasing willingness of large buyers to sign contracts for their annual requirements of chemical materials evidence this return to stability upon the new basis. But the most significant indicator of all is the fact that the important price changes of the last couple of years have been downwards under the influence of lower costs due to improved technique. Phenol, methanol, aniline oil, certain phosphorus compounds, aluminum chloride, lactic acid, furnish notable examples of lower prices resulting from new processes. Increased production has exerted a downward pressure upon the price of chlorine, ammonia, calcium chloride, and borax. Among such groups as the solvents, the plasticizers, and the rubber accelerators, both new processes and new products have been developing with a bewildering rapidity that has had marked effects upon the markets. Such price reductions as amyl alcohol from $2.25 to $1.65 a gallon, ethylene glycol from 40c to 25c a pound; diphenylguanidine from 72c to 30c a pound measure rather graphically the commercial results of technical advances.

New Technique in An Old Industry

Naturally the effects of improved chemical technique are felt most among the new industries. Especially is this true in lacquer manufacture where we still find endless experiment with formulae. However, these chemical developments touch the older industries also, as indeed the very oldest of all chemical process industries proves. Borax at half its former price has increased its consumption by some fifteen per cent, and the bulk of this increase has certainly gone into the glass pots. Here cheap borax has made possible new types of glass and so cut the costs of the tougher, more brilliant glass as to make possible competition with porcelain in electrical work, with marble and tiles as a building material, and bringing fine household glassware even down to the counters of our five-and-ten cent stores.

During the year the petroleum industry has seen two chemical developments of importance. The per-

fection by the Gulf Refining Company of a process for the direct production of aluminum chloride from bauxite is a clever piece of chemical work which promises great economies. The introduction at the, Bayonne plant of the Standard Oil Company of New Jersey, of the German process for the hydrogenation of the heavy oil distillates has great possibilities in new products and threatens curtailment of the vast consumption of sulfuric acid in gasoline refining. In this same connection it is to be noted that in spite of—or possibly because of—a three-cornered patent fight between the Monsanto, Selden, and General companies many sulfuric acid plants are being equipped with vanadium catalyst contact process.

Advances in Chemical Fertilizers

Meanwhile the chemicalization of the fertilizer industry is advancing rapidly. January, 1929 saw the first shipment of American-made synthetic nitrate of soda from the Hopewell works of the Allied Chemical and Dye Corporation. The treatment of acid phosphate with ammonia is spreading, pushed by the two largest sellers of ammonia. This new outlet is opportune, for with the increased output of synthetic ammonia by the Du Ponts, there is a prospective over-production. Superphosphate tends constantly to higher concentrations. The 45 per cent material is offered on the market and American Cyanamid is building a plant near its phosphate rock property at Plant City, Florida, where, so it is rumored, 60 per cent superphosphate will be made. Several other of the phosphate producing companies are working on chemical outlets in the various calcium and ammonium salts, while the International Agricultural Company is building a new complete fertilizer factory at Texarkana, Arkansas. The Federal Phosphorus Company has recently invaded the fertilizer field with a di-ammonium phosphate mixture of higher plant food content (67 per cent) than the German nitrophoska. Quite recently the Shell Chemical Company (subsidiary of Royal Dutch-Shell interests) has announced plans for a $5,000,000 nitrogen fixation plant at Long Beach, California, to operate a Haber-Bosch process. It is proposed here to recover the hydrogen evolved in the manufacture of carbon black from the natural gas of the nearby oil fields.

Pacific Coast Developments

There have been other interesting chemical developments on the Pacific Coast. Two new electrolytic alkali plants have been completed this year. Both are situated at Tacoma, Washington, with an eye on the growing market for chlorine in the paper mills of the Northwest; and although the Pennsylvania Salt Company has only made trial runs, the Hooker Electrochemical Company is reported to be running at capacity. These new plants and the activity at the Pacific Coast operations of the Stauffer and the General Chemical companies is tangible evidence of the industrial expansion of the Far West.

During the year just past there have been certain significant increases in our American chemical production. Carbon bi-sulfide, hydrogen peroxide, borax, citric acid from the new fermentation process of Charles Pfizer & Company, aluminum chloride and aluminum sulfate, both by new processes and direct from bauxite, have all been notably increased. However, the most profound changes have been in the synthetic manufacture of wood distillation chemicals, a field in which for many years American natural products have been important factors in world commerce. The output of synthetic acetic acid begun in 1928 by the Niacet Chemical Company at Niagara Falls has been increased during 1929, and it has been joined by the synthetic manufacture of acetone and methanol. The acetone development was undoubtedly stimulated by the demands of the rayon industry, while the methanol operation is predicated upon by a product-process in the manufacture of anhydrous ammonia with the commercial objective of greatly extending the consumption by lower prices. The Du Pont operation in West Virginia contemplates an output of 6,000,000 gallons of pure methanol, which is about a third larger than the total production of refined material of all grades prior to 1925 when the first synthetic material came into the market. This quantity of methanol, it must be remembered, is entirely additional to the considerable synthetic production of the Commercial Solvents' Corporation, and will compel an entirely new economic equilibrium. As an example of the far-reaching effects, the lower price of methanol will mean a lower price for formaldehyde which, combined with the lower price of phenol, will be reflected in phenolic resins, promising a greater consumption which, in turn, will create bigger demands for tar acids, natural products for which no suitable substitute is available. If the price of cresylic acid should advance, in response to this demand, it might coax our steel industry into stripping their coke oven gases before burning them as is their present wasteful practice.

Progress in Plastics

The increased use of various phenolic resins has been accompanied by other interesting developments in this plastics field. The phthalic moulded products have come forward rapidly. The glyptal resins are invading the lacquer field in competition with nitrocellulose. There is accordingly not only additional use of di-butyl phthalate as a plasticizer, but also of di-ethyl phthalate as a solvent. In the many new uses of the various plastics, an automobile body of this moulded material is perhaps the boldest and most suggestive experiment recently undertaken.

Among chemical raw materials sulfur and zinc stand out during the year just passed. A new sulfur dome has been brought into production by the Duval Texas Sulfur Company which has already begun export shipments to several European countries. Electrolytic zinc, produced by the Tainton high density current process, is on the market from the Hecla operation in Idaho. This has a capacity of 50 tons daily with handling equipment ready to care for twice this amount simply by expanding the cells and roasting capacity. A similar plant is building at Monsanto, Illinois, for the Evans-Wallower interests to operate on ore from the Joplin district. Comparative economics of these two are interesting—the power cost in Idaho of about a half what it is in Missouri, balanced against a ready market for sulfuric acid in the St. Louis district.

Remarkable as has been the progress made during 1929 in both new processes and new plants, nevertheless, these pale before the sensational financial developments.

The Merger Movement

"Big business" is no new phenomenon in American chemical circles. We have, it is true, no single dominating company comparable in position to the German I. G., the British I. C. I., the French Kuhlmann, or the Italian Montecatini. We do have, however, three chemical giants, two of which are larger in capitalization and in sales than the I. G. and all three of which are, by the same measures, bigger than all those other European chemical trusts. Experience the world round pretty plainly indicates that the modern manufacture of chemical products is inherently a large scale industrial activity. It takes a veritable Samson to juggle cannon balls, and chemical production with its multitudinous by-products, its interlocking markets, its costly research; its high obsolescence; its endless competition not only with new processes but also with new products, obviously lends itself to concentration. This building up of larger and ever larger units has gone on for years in this country. During the past year, however, growth in this direction has been startling. It has been accomplished by a type of combination new to American experience, mergers made not to eliminate competition by joining units making the same or similar products; but mergers made with purpose of widening the activities, broadening the markets, and thus spreading the risks.

Most conspicuous in this movement has been the American Cyanamid Company, which during the past year has acquired the Calco Chemical Company (intermediates, dyes, dry colors, and coal-tar pharmaceuticals), the Selden Company (phthalic anhydride) Kalbfleisch Corporation (heavy chemicals), and the American Powder Company (explosives and solvents). Furthermore the Calco interests have acquired the Crown Chemical Company (paranitraniline and other intermediates) the King Chemical Company (sulfur dioxide) and the Textile Chemical Company (naphthol and azo dyes). Cyanamid has moreover, bought a large limestone quarry in Canada and is building new plants in Florida and Tennessee. Additions to existing works include increase in the Niagara Falls cyanamid plant by about 100,000 tons per year; increased ammo-phos capacity at Warners, N. J. by about 50,000 tons, and extensive new building at Linden and Bound Brook, N. J.

Alcohol Consolidations

Consolidations in the alcohol industry have continued. The Rossville Company was formed the first month of the year out of the Rossville, Federal Products, Orange Grove Distillery, Seaboard Chemical, and Industrial Chemical Manufacturing companies. Early in the spring the General Industrial Alcohol group was merged and shortly afterwards United States Industrial Alcohol and Kentucky Alcohol (Du Pont) joined forces. In the solvents' field American Commercial Alcohol has acquired the Kessler Chemical Company and the Pennsylvania Sugar Company, the Franco-American Chemical Works, while the Newport interests have taken over the Rhodia Chemical Works.

The Du Ponts, following their combination with Grasselli, have been consolidating their own subsidiaries into a closer-knit organization. During the year they have taken over direct control of their rayon and cellophane investments, and acquired the Lazote, the National Ammonia, and the Pacific Ammonia concerns. A new chemical holding company has appeared in United Chemicals, Inc., which during the year has taken over the majority stock of Westvaco Chlorine Products Company, the Monarch Chemical Company (baking powder), Barium Products, Ltd., and Peroxide Manufacturing Company. A number of independent feldspar interests have been amalgamated in the $8,000,000,000 Consolidated Feldspar Company, and the historic "Big Six" of the fertilizer industry has become now "Big Seven" since the Davidson Chemical Company collected into a group seven other fertilizer manufacturers. Last but not least, the Monsanto Chemical Works has entered upon a program of expansion, having secured control of the Merrimac Chemical Company (heavy chemicals) the Commonwealth Chemical Company (the benzoate and other fine chemical divisions of the Mathieson Alkali Works), and the Rubber Service Laboratories (coal-tar accelerators).

Chemicals and Wall Street

These extensive reorganizations—although the mergers have generally been effected through exchange of stock—have called for revised financial set-ups. The increased capital and public trading in the shares of old, closely held companies, has naturally attracted

the attention of Wall Street. There is building up a group of chemical securities which are beginning to be as familiar in financial circles as the steels, the oils, the railways, etc. This interest has been whetted by some big stock dividends among the chemical companies—Dow 400 per cent; Du Pont 350 per cent; Mathieson Alkali and Union Carbide 300 per cent; and Monsanto and American Commercial Alcohol 200 per cent. It is interesting to note that amid Wall Street's recent earthquake, compared with other well defined industrial groups, the mark down of chemical securities' values was much less than the average.

At the time of writing (early in December) it is not yet possible to forecast what the reprecussion of this speculative debacle will be. It came at the opening of winter, with the holiday trade and the contract season for chemicals in the offing; but despite this inopportune time, it has to date apparently had but little effect except upon the avowedly luxury goods.

Chemicals and the Tariff

Of more immediate concern to the chemical industrialist is the fate of the new tariff bill. Insofar as the chemical duties were concerned the bill approved by the House of Representatives and rejected by the Senate, contained few material changes. The most important revisions were the inclusion of a number of new chemicals, mostly of synthetic origin and chiefly used in the solvents or plastics industries, which have come into commercial prominence since the passage of the last tariff act of 1922. The Senate has played politics with this important piece of economic legislation, and while it is unlikely indeed that there will be any radical change in the thoroughly protective policy of the Republican party, nevertheless, there has been injected into the situation a new factor of unknown power and disquieting possibilities, in the demand for the protection of agricultural interests. This call for duties on certain industrial raw materials (the vegetable oils are an example) and upon foodstuffs is new. It may well become the rallying cry of a new alignment—urban and rural—of our political parties.

Produits Chimiques de Tessenderloo, a Belgian company, and the Societe des Potasses d'Alsace are joining in a project to form a new company and erect a plant for the manufacture of caustic potash in the Limberg region. The Tessenderloo company manufactures the caustic by an electrolytic process, but its plant capacity is not sufficient to meet increasing demands. The Tessenderloo company has increased its capitalization from 35,000,000 to 45,000,000 francs to finance its share of the Limberg undertaking.

German Patent 463,792, granted to W. Kasch of Berlin-Wilmersdorf, describes a mixture of ammonium chloride, sodium carbonate, and water, which is cheap, easily obtainable, and gives a temperature drop of 31° C. A mixture of 100 parts of ammonium chloride, 150 parts of sodium carbonate (anhydrous), and 300 parts of water is recommended as the most advantageous.

The Industry's Bookshelf

Medical Leaders from Hippocrates to Osler, by S. W. Lambert, M.D., and G. M. Goodwin, M.D., 331 pages, Bobbs Merrill Co., New York, $5.00 net.
Studies of the famous personalities of medicine.

Dictionary of Technical Terms, by F. S. Crispin, 284 pages, Bruce Publishing Co., Milwaukee, Wis., $1.25 net.
Definitions of commonly used expressions in architecture, woodworking and building trades, electrical and metal-working trades, chemistry, etc.

Tips from a Thousand Salesmen, by J. C. Aspley, 252 pages, Dartnell Corporation, Chicago, Ill., $3.75 net.
Editorials for salesmen containing plans, policies and ideas of other salesmen.

The Story of Money, by Norman Angell, 411 pages, $5.00, published by F. A. Stokes Co., New York.
A story, written for the laymen, of man's experiences with the device of money—his experiemnts, ideas and mistakes concerning it.

Introduction to Business Management, by Herbert G. Stockwell, 276 pages, $4.00 published by Harper & Bros., New York.
An outline of the important business activities or functions and offices, and how different kinds of managers of those offices think, feel and act.

Organic and Food Chemistry, by Culver and Rogers, 212 pages, $1.50, P. Blackiston's Son & Co., Philadelphia, Pa.
Chemistry for those preparing to become teachers of domestic science.

To-morrow's Advertisers and Their Advertising Agencies, by George Harrison Phelps, 256 pages, $3.50, published by Harper & Bros., N. Y.
A discussion of modern trends in advertising with a picture of the broadening scope and power of advertising as it is being worked out by the most successful advertisers and their agencies.

The Manufacturer and His Outlets, by Chester E. Haring, 190 pages, $3.00, published by Harper & Bros., New York.
Retailing as it exists to-day as described by an advertising agency executive.

Millions in Mergers, by H. A. Toulmin, Jr., 323 pages, $3.50, B. C. Forbes Publishing Co., New York.
The fundamental principles underlying mergers to make them economically successful and legally safe, as illustrated by merger experiences and evalued in the light of historical precedent and present economic conditions.

The Conquest of Thought by Invention, by H. Stafford Hatfield, 80 pages, W. W. Norton & Co., New York $1.00 net.
What will happen to society when life finally becomes completely mechanized by physical, social and political machinery.

Hackh's Chemical Dictionary, 790 pages, P. Blakiston's Son & Co., Philadelphia, Pa., $10.00 net.
Contains the words generally used in chemistry and many of the terms used in related sciences, together with their pronunciations.

BRITISH

By M. D. Curzen
Editor,
INDUSTRIAL CHEMIST (London)

trend in past year's chemical trade has been towards market progress and consolidation by big

INTERESTS

IN GREAT BRITAIN production figures for the chemical industry are non-existent except for some very few products, and these, when available, are nearly a year late. Accordingly, the only industrial picture we can make is that formed from the import and export figures. The accompanying tables have been constructed from the Board of Trade figures, and relate to the first ten months of the year. It will be seen that the chemical industry has had both its bright and dingy spots.

The most important increases in exports are due to ammonium sulfate, dyes, and drugs. In dealing with the first named the work of the Imperial Chemical Industries is of major importance. The increase is almost solely due to the increased production of this firm, the manufacture of by-product ammonium sulfate being only slightly increased above that of the previous year. Calculating the exports for the 12 months of 1929 as probably about 550,000 tons, this would indicate an increase of slightly more than 28 per cent over 1928. With a home consumption of from 170,000—185,000 tons, we obtain a total production of nearly three-quarters of a million tons.

In view of the reiterated statements in the daily press with regard to the lack of salesmanship abroad of the average British manufacturer, it is heartening to read the following expression of opinion delivered by C. C. Concannon, Chief of the Chemical Division, American Department of Commerce at the Sixth Annual Chemical Industries Dinner on May 9, 1929 in New York:—

"British chemical interests, through Imperial Chemical Industries, Ltd. have been making strenuous efforts to facilitate Latin American trade through the establishment of subsidiary companies or allied companies in various South American countries. Latin America is a logical customer of ours for our chemical products, yet we are facing keen rivalry in that part of the world and even keener competition in the vast potential markets of the Far East."

It is significant that since 1926, British exports of ammonium sulfate have increased about 250 per cent while American exports in this commodity have decreased nearly 50 per cent. The reason for this amazing increase, we are sure, can be laid at the door of Imperial Chemical Industries and the very fine organizations—the British Sulfate of Ammonia Federation and Nitram, Ltd. now in charge of propaganda.

The world is still agitated with regard to overproduction in fertilizers,

EXPORTS FOR 10 MONTHS ENDING OCTOBER 1929

Value in Pounds Sterling

Commodity	1928	1929	Increase or Decrease over 1928
Sulfuric Acid	36,100	45,100	+ 9,000
Ammon. Sulfate	3,221,000	4,129,900	+ 908,900
Bleaching Powder	172,600	149,900	— 22,700
Coal Tar Prods.	2,114,400	1,444,400	— 670,000
Copper Sulf. & Disn.	1,865,700	1,760,400	— 105,300
Potass. Compounds	198,800	173,400	— 25,400
Sodium "	3,289,500	3,146,000	— 143,500
Dyes "	737,300	920,200	+ 182,900
Painters' Colors	3,277,800	3,334,900	+ 57,100
Other Chemicals	2,956,200	3,122,300	+ 166,100
Drugs, Medicines	2,502,400	2,700,400	+ 198,000
Total*	21,015,300	21,487,500	+ 472,200

IMPORTS FOR 10 MONTHS ENDING OCTOBER 1929

Value in Pounds Sterling

Commodity	1928	1929	Increase or Decrease
Acetic Acid	581,200	612,400	+ 31,200
Borax	103,200	50,600	— 52,600
Coal Tar Prods.	328,500	346,900	+ 18,400
Potass. Compounds	976,500	1,167,100	+ 190,600
Sodium "	949,100	956,500	+ 7,400
Intermediates, Dyes &Dye Extracts	1,034,900	1,111,100	+ 76,200
Painters' Colors	1,760,200	1,869,700	+ 109,500
Total*	12,605,900	14,006,000	+ 1,400,100

*Some few exports and imports are not included in the above list.

A view of one section of the new agricultural experimental station of Imperial Chemical Industries, Ltd., which was opened in July of this year at Jeallott's Hill in Berkshire, England.

but a heartening effect was created this year through the increased use of these products in America and Japan. As a result of keen rivalry, an important working agreement was reached between Imperial Chemical Industries, Interessen Germeinschaft fur Farbenindustrie, and the producers of Chilean nitrate, with the result that prices of all forms of nitrogen dropped 10 per cent.

At present the daily papers are shouting for Empire Free Trade. We must remember that Lord Melchett, chairman of Imperial Chemical Industries, has long and often advocated this step, and we regard the opening in July of this year, of the remarkable agricultural experimental station at Jeallott's Hill in Berkshire, as one of the practical solutions to the great Empire problem. This station which is in touch with many workers all over the world, is experimenting on more than 1,200 plots on various problems.

Sulfuric Acid in Good Domestic Demand

Sulfuric acid which was once considered as the criterion of chemical trade is in a very curious position. Exports have almost vanished owing to the great increase in manufacture abroad. Many of its users in the chemical industry have disappeared, and yet the demand at home is quite good, probably due to the artificial silk, motor-car and radio industries, although the latter cannot consume great quantities. It is a fact that manufacturers in this country are not so despondent as they were a few years ago, and several firms are improving their plant and one in London is increasing output by installing three more burners.

Coal Tar Difficulties

The worst feature in the exports is that of coal tar products which has dropped over 30 per cent in value compared with 1928. Carbolic acid and creosote oils are the offenders. The reason for the falling off of the last named is the growing home production in America and the change in the demand for steel sleepers instead of timber sleepers. The problem to the tar-distillers is so acute and stocks at home are increasing so rapidly, that the Association of British Tar Distillers recently convened a meeting to advise the formation of a Wood Preserving Association similar to the American association that has been in existence for some 25 years. The objects of the Association are to prevent the wastage of wood, to promote proper means of preserving wood and to co-ordinate research upon the problems arising. It will co-operate with His Majesty's Forests Products Research Laboratory at Princes Risborough.

Mixed Tendencies in Dyestuffs

An important increase in exports is noted under dyestuffs, although to counteract this we observe also an increase in the imports. It is significant that in spite of the Dyestuffs Act, we import more than we export, and that the bulk of the imports arrive from Germany. The next year will be regarded with great anxiety for the Dyestuffs (Import Regulation) Act expires on January 14th, 1931.

Manufacture of dyestuffs in this country has not been a smooth path, and the cause has in past, we fear, been internal dissention. There has been little *esprit de corps* and in some instances, there has been little co-operation between various departments. The research departments were estranged from the works, and the intermediate departments were at loggerheads with the dye-making houses. Such folly, has in large part, now been eliminated, and we are all looking forward to the time when the dyestuffs industry will be able to stand without the necessity of tariffs.

It is surprising how narrow is the vision of the dyestuffs industry in this country. With the exception only of the British Dyestuffs Corporation, there

is, we believe, no dyestuffs factory that produces anything but dyestuffs, and yet the dyestuffs industry should be but a subsidiary to a vast organic chemical industry. And even British Dyestuffs Corporation produces little else beyond some rubber accelerators, a few wetting agents and more latterly ethylene glycol. It is interesting to make a comparison with the patents issued in the last few years by the I. G. on such varying products, as, synthetic rubber, emulsifying agents, cellulose lacquers, lubricating and insulating oils, nitro-cellulose softeners, perfumes, synthetic resins, waxes, vitamins, etc.

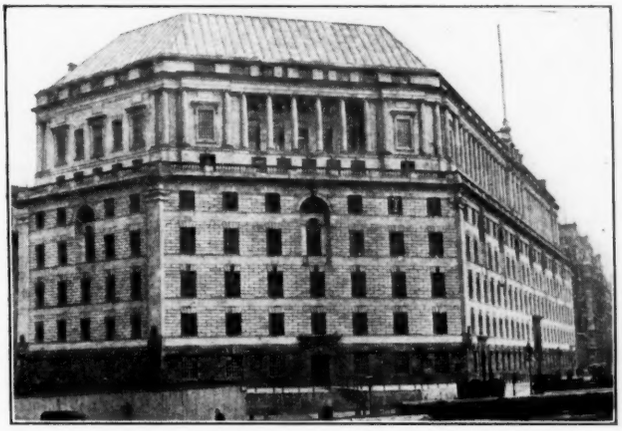
Chemical Engineering Activity

A good indication of the progress in home production is that supplied by the excellent position of the chemical engineering firms of the country. With very few exceptions indeed, they are very busy, not only with new works and new extensions but also with replacements by modern plants.

The increasing use of new construction materials especially of the new acid resisting metals and alloys is giving increasing work to the metal and alloy foundries and to the chemical engineers who make the plant. It is noteworthy also that at least two British firms, are now making homogeneously lead lined plant while the rubber companies are now seriously devoting themselves to the chemical and allied industries.

British Industrial Solvents, Ltd.

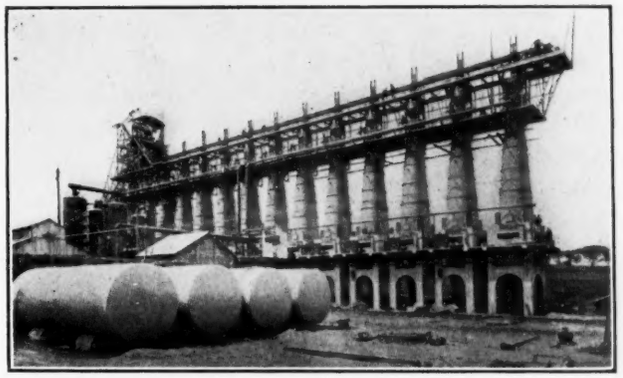
The number of new plants that have been erected this year has been very large. One of the most important (apart from the big extensions at Billingham) and significant of the solvent industry, was the formation of British Industrial Solvents Ltd. a subsidiary company of the great Distillers Ltd. organization. The new works are at Salt End, Hull, and apart from alcohol and vinegar, this firm proposes to produce chemicals for the artificial silk and lacquer industries. These chemicals will include acetone, acetic acid, butyl alcohol and many esters. It will be remembered that the Distillers Co. is interested also in the Prodor process of producing sugar from wood.



New headquarters of Imperial Chemical Industries, Ltd., on the Thames Embankment.

The Zinc Manufacturing Co. (N. C. Metal Co.) utilizing the Coley process, has this year started operations with six new plants at the Dartford works, producing spelter.

Of other important works and plants that are being erected we note those of the Non-Inflammable Film Co.; the installation of the first activated carbon plant by British Carbo-Union in a gas works in this country for the extraction of benzol from gas at the Harrow Gas Works, at least two for the production of "indestructible" glass and another for the deposition of metal on almost any substance.



View of the Bussey Low Temperature Carbonization Process which started operations at Glenboig, Glasgow, during the past year.

Artificial Silk Industry Off

This has been a poor year for artificial silk producers owing to unfavourable trade conditions and a big drop in price. Several firms have lost money, but the big firms are still in a strong position. Western Viscose is in the hands of the receivers and The Yorkshire Artificial Silk Co. has been wound up. New issues have been made by Atlas Artificial Silk Processes Ltd. which is now under production, and an amalgamation of the British Visada, Littleborough Artificial Silk Co. and British Breda Silk has taken place, while the first unit of The Cellulose Acetate Silk Co. is now complete with a capacity of 4 tons per day.

In spite of generally unfavorable conditions, production in this country has rather increased and the demand is now better especially by Australia and Norway.

Low Temperature Distillation Progress

The low temperature distillation of coal occupies the scientific and public eye, although neither the walls of Jericho nor of Glasgow have been blown down by the trumpets. Little news is heard of any of the processes although those of the Fuel Research Department and Salermo are stated to be working

satisfactorily. At Nuneaton, Mr. George Helps is supplying low grade gas to the town and has installed the McLaurin and Midland processes, although the special fuel obtained is not the main object in view.

New High Pressure Laboratories

One of the most significant happenings this year in pure scientific advance has been the opening of the new high-pressure laboratories at the Imperial College of Science. These are undoubtedly the finest of their type in the world and will form an excellent training ground for the recruits for forthcoming industries which will be born of high pressure and high pressure catalytic research.

Mitsui Interests Plan Increase in Japan's Synthetic Acetic Output

Japan Synthetic Chemical Co. at Ogaki, Gifu Prefecture, the largest producer of acetic acid in Japan, was recently taken over by the Mitsui interests, which raised the capital from 200,000 yen to 1,000,000 yen (Value of yen = $0.4776 United States currency). A study has been made of the manufacture of synthetic acetic acid, but so far the output has been very small. Large quantities of acetic acid have been imported from Germany and the United States, and it is the aim of Mitsui & Co. to increase the local production of synthetic acetic acid. The company heretofore supplied 80 per cent of the demand for domestic acetic acid and now controls the entire supply. The Japan Synthetic Chemical Co.'s new factory at Ogaki was completed in September of this year, and it is expected that the new machinery will be installed during November, according to the Department of Commerce. The Mitsui interests estimate that 90 per cent of the domestic demand for acetic acid will be supplied by the new company, which is the only establishment in Japan using the synthetic process of manufacture, and it is reported that the Government has decided to grant 30,000 yen this year towards the encouragement of the industry.

Synthetic methanol by the Casale process is now being applied industrially at the plant of the "Siri" (Societa Ricerche Industriali) at Terni, Italy. The Ammonia Casale and the Societa Terni are jointly interested in this plant to the extent of 60 per cent and 40 per cent respectively. The "Siri" plant is now producing a ton and a half of synthetic methanol daily, which is as much as can be absorbed by the Italian market at present. The plant has a capacity of six tons daily, says the Department of Commerce. Methanol obtained by this process is reported to be cheaper than that produced by other processes and it is thought that the production of cheap methanol may be a decisive factor in bringing about a change in the composition of motor fuel. Licenses have already been granted in France, Switzerland, Russia, and Germany.

Societe Industrielle de Languedoc is reported to be manufacturing dehydrated calcium tartrate, containing from 73—78 per cent of tartaric acid, at its works at St. Laurent d'Aigouze, while the Soc. Alsacienne de Prod. Chimiques is installing a plant at Rochelle-Palice for the manufacture of the new product, known as supertartrate. The Soc. Industrielle is said to be negotiating for the cession of its patent rights for other countries.

I. G. Farbenindustrie and Vereinigte Glanzstoff agree on common rayon policy and will now work for an international agreement to regulate production.

Who's Who In Chemical Industry

Carr, George R., vice president and general manager, Dearborn Chemical Company. Born, Argenta, Ill., 23 Jan. 1877; mar., Katherine Mortenson, San Francisco, Calif., 15 July 1913; children, 2 daus.; educat., Univ. Ill., B. S., 1901. Dearborn Chem. Co., joined Sales Dept., and has held various positions, since 1901, vice pres. & genl. mgr., past 17 yrs. Clubs: University, Chicago Ath. Assn., Racquet, Old Elm, Onwentsia. Shoreacres, New York, Bohemian (San Francisco), Kappa Sigma. Hobby: golf. Address: Dearborn Chemical Co., 310 South Michigan Ave., Chicago, Ill.

Holter, William L., eastern sales manager, Van Schaack Bros. Chem. Wks., and president, Chemical Products Corp. Born, 20 Oct. 1895, Stillwater, Okla; mar., Helen Moore, Chicago, 3 Mar. 1920; children, 1 son; educat., Penn. State, B.S., 1915; Univ. Calif., A. B., 1916. Hercules Powder Co., 1916-20; present position since 1920. Memb., Amer. Soc. Test. Matls.; Phi Kappa Sigma. Clubs: University (Boston), Chemists' (N. Y.), Boston City. Address: Van Schaack Bros. Chem. Wks., Inc., 687 Boylston st., Boston, Mass.

Mumford, Russell William, assistant manager, American Potash & Chemical Corp. Born, Cleveland, O., 15 Oct. 1890; mar., Henrietta Monroe Clevenger, Cleveland, Ohio, 14 Aug. 1915; children, 3 sons, 1 dau.; educat., Mich. State Normal Coll., A.B., 1914; Columbia Univ., A.M., 1915. U. S. Indust. Chem. Co., supt. prods., 1917-19; Amer. Trona Corp., chem. Eng. & asst. mgr. 1920-26; Amer. Potash & Chem. Corp., asst. mgr., 1926 to date. Patents on activated charcoal. Patents and development of processes and equipment for handling Searles Lake brine for the prod. of potash, borax, boric acid, etc. Memb., Amer. Chem. Soc., Amer. Geog. Soc., Amer. Meteorological Soc., Phi Lambda Upsilon, Sigma Xi. Address: American Potash & Chem. Corp., Trona, Cal.

Noyes, Harry L., chief engineer, Union Carbide Company. Born, Chicago, Ill., 1868; mar., Anna Hyatt Ransom, Ulster, Pa.; children, 4; educat., Mass Inst. Tech., S.B., 1890. N. Y. State Canals, asst. engr., 1896; Union Carbide Co., engr., 1898, chief engr., 1915 to date. Pres. Common Council, Niagara Falls, N. Y., 1904; Port Authority Survey Comm., 1927. Memb., Amer. Electro-chem. Soc., Amer. Soc. Civil Engrs. Clubs: Niagara, Niagara Falls Country. Address: Union Carbide Co., Niagara Falls, N. Y.

Schmertz, John Robert, advertising manager The Mathieson Alkali Works, Inc. Born, Pittsburgh, Pa., 23 Sept. 1895; mar., Elizabeth J. Maneely, Phila., Pa., 28 Apr. 1924; children, 1 dau.; educat., Yale University., Ph.B. (chem.), 1918. Lehn & Fink, Inc., employment mgr., 1919-20; Natl. Carbon Co., sales dept., 1920-22; Mathieson Alkali Works, adv. mgr., 1922 to date. Chem. War Serv., N. A., 1918-19. Memb., Salesmen's Assn. Amer. Chem. Ind., Chi Phi Frat. Hobbies: tennis, books. Address: Mathieson Alkali Works, Inc., 250 Park Ave., New York City.

Wehrly, Charles S., manager chemical department, Henry W. Peabody & Co. Born, Somerville, N. J., 26 Aug. 1890; mar., Adelaide Hinricks, New York, 12 Aug. 1925; children, 1 dau.; educat., Rutgers & Columbia Univ. Alex H. Pickering, London, 1919-22; Alex Pickering & Co., Inc., vice pres., 1922-25; Henry W. Peabody & Co., 1925 to date. Advisory chemist, Reparations Commission, London. Member, Amer. Chem. Soc. Hobby: bridge. Address: H. W. Peabody & Co., 17 State St., New York City.

French

By J. H. Frydlender

Collaborator, Revue des Produits Chimiques

chemical manufacturers consolidate their post-war advances in production, exports and technique in a year of notable chemical

progress

WITH the post-war period an epoch of increased activity in the French chemical industry began, which has been still more intensified in the course of 1929.

Among the French chemical enterprises, the 53 companies quoted on the Stock Exchange represent a capital which as of November 8 amounted to 20 billion francs according to Exchange value. Most of the large companies during 1929 went ahead with substantial increases in capital, either for plant expansion or additions of new products.

A closer and closer bond is being established between the large chemical companies and mining companies. The latter are adding chemical manufactures to their schedules to utilize the by-products of their coke plants, or in common with the chemical establishments they are forming companies for private exploitations.

Growing Organic Chemical Industry

Alongside the industrial development of chemistry and metallurgy, an industry of organic synthesis has risen since the war. The dye industry, following a recession in 1927, picked up again in 1928 and is continuing to progress. Receiving the tar on advantageous terms from the coke plants, although still dependent for a part from abroad, it produces all the colors demanded by the home market. The latter is developing intensively, since fashion, which plays a very important part in France, is always seeking new tints. Explosives, pharmaceutical products, photographic products, etc. are following the same ascensional line. Thermic and catalytic processes are arousing ever-increasing interest. Distilling industries, such as the manufacture of alcohol, carbonization of wood and the resin industry are showing a satisfactory development. The resin industry, concentrated in the southwest of France, supplies about one-fifth of the world's production of essence of turpentine and of resin. It ranks immediately after the United States and far ahead of Spain and Portugal. An integral part of the French chemical industry rests upon the use of hydro-electric power which at the present time, reaches 8 million H. P. in France.

The structure of the French chemical industries recalls that of the United States rather than that of Germany and of England. It is distributed over the whole territory, according to the raw materials and the sources of energy. No such concentration as the I. G. and the I. C. I. exists. It is replaced by a pooling of interests. The Etablissements Kuhlmann in particular show a great expansion along the lines traced by their eminent president, Donat Agache, who died in the course of the year.

At the same time as production increases commercial expansion likewise grows. In 1928 the chemical industry held fourth place among French industries with its exportation of 33 billion francs.

Chemistry and Agriculture

Inasmuch as France is as much an industrial country as an agricultural one a close bond exists between agriculture and the great French chemical industry. Fifty thousand tons of sulfate of ammonia are recovered from coke oven gases in the north and in the Straits of Dover, representing 43 per cent of the national production. Manufacture by synthesis amounts to about 18,000 tons of ammonia, equivalent to 70,000 tons of sulfate. The methods of Casale, Claude, Haber-Bosch and Frank-Caro, the latter starting from calcium cyanamid, are in practice. The patents covering the Casale process are owned, for France, by the Societe Alais, Froges et Camargue, which has assigned the licenses on them to the Societe

Ammonia aux Produits Chimiques of Roche-la-Moliere, and to the National Office of Nitrogen.

There are twenty-two nitrogen fixation plants in France: ten by the Casale process, seven by the Claude process and five Frank-Caro cyananid plants. The yearly production is distributed as follows: 16,000 tons, Casale; 18,000 tons, Claude; and 12,000 tons, Frank-Caro, or a total of 46,000 tons. These data are of July, 1929. At that same period it was forecast that at the end of the year the yearly production of ammonia would reach 100,000 tons.

The Toulouse plant gave an average daily production of 20 tons of ammonia in November 1928; 27 tons in December, 1928; 30.7 tons in January, 1929, and since then there has been steady progression.

With an eye to the improvements and elasticity of operation at the Toulouse plant, the National Industrial Office of Nitrogen has asked by way of reparation payments in kind, for a Haber synthesis plant which will work parallel with the Casale plant. The cost of the Haber installation is 16,500,000 francs.

In the mining centers the Claude and Casale processes are in use. Hydrogen is made by the Claude and Linde process of liquefaction of the gases of the coke ovens. It is in this way that, among others, the Mining Companies of Aniche, Bethune, Lens, Lieven and Marles are operating.

In the production of ammonia, Etablissements Kuhlmann stand in first place. They share in the different enterprises producing ammonia and they recently formed the Societe Chimique Marles-Kuhlmann, with a capital of 20 million francs, whose object is the manufacture of sulfate of ammonia starting from the gases of the coke ovens of the Compagnie des Mines of Marles. Within a short time the importation of sulfate of ammonia in France will be reduced to the minimum.

New Synthetic Fertilizers

The Office National Industriel de l'Azote has accomplished the manufacture at its Toulouse plants of sulfo-nitrate of ammonia, which is a mixture of nitrate of ammonia and sulfate of ammonia; from sulfo-nitrate of lime and ammonia, a mixture of nitrate of ammonia with a certain percentage of sulfate of lime, and from nitro-potash, made up of nitrate of ammonia and of potassium chloride. The Aniche Mining Company, acting with the Synthetic Ammonia people, is increasing its capital from 45 to 90 million francs. They operate the Claude process and in the course of the year have marketed a fertilizer, "potazote," manufactured by substituting in the Solvay process sylvinite for sodium chloride. The potazote with 14 per cent ammoniacal nitrogen and 20 per cent potash is manufactured at the present time in large quantities at the plant of the Ammoniaque Synthetique in Waziers.

In examining the development of the French chemical industry one realizes the efforts made to use hydro-electric power more and more. Projects are now under way to harness of the water power of the Rhone on a grandiose scale. This power is already being utilized by different companies. It constitutes on the one hand the basis of a powerful electro-chemical industry and on the other the basis of an electro-thermic industry utilizing the heat supplied by the electric current for the production of fertilizers and other chemical products.

Hydroelectric Developments

The Company of Nitrogenized Products produces 60,000 tons of calcium cyanamid in the plant of Lannemezan. It is also importing electric energy from Switzerland and utilizing the motor power plants installed on the Garonne. The Societe Le Nitrogene for the production of nitric acid, sodium nitrate, nitro-phosphate and calcium nitrate in Roche-de-Rame utilizes the fall of the Biaise and the electric energy of Briancon. It purposes installing right in Briancon a plant for calcium nitrate and calcium cyanamid.

Calcium carbide is manufactured by 23 enterprises, including, among others, the Societe d'Electrochimie, d'Electrometallurgie et des Acieries Electriques d'Ugine (5 plants); Societe Industrielle de Produits Chimiques, Bozel-Maletra; Compagnie des Produits Chimiques et Metallurgiques Alais, Froges et Camarague; Manufacture des Glaces et Produits Chimiques de Sainta-Gobain.

The attempts to create a national synthetic fertilizer industry are at present threatened by the agreement between Chile, Germany (I. G.) and England (I.C.I. Ltd.), grouping 80 per cent of the production of nitrogenous fertilizers. The decline in these fertilizers has its repercussion in the French market and the Government is being asked to afford tariff protection for the growing fertilizer industry. Nevertheless, agriculture is opposed to any rise in the customs duties and is in favor of a policy of subsidies. On the other hand, a display train making tours of the country is arousing the farmers' interest in fertilizers and thanks to this skilful propaganda an increase in fertilizer consumption is looked forward to

The Alsace potash mines contain in the part surveyed at the present time 1,780 million tons of crude salt, or 300 million tons of pure potash. The deposit extends beyond the limits surveyed formerly and a new concession has just been granted. The production of crude salts, which in 1913 was 350,000 tons, reached 1.2 million tons in 1920; 1.9 million in 1925; 2.3 million in 1926; 2.3 million in 1927 and 2.6 million in 1928.

The mines of Alsace produce for agriculture potassium chloride with guaranteed minimum of 49 per cent purity, potassium chloride for industry, 98 per cent grade or 62 per cent of pure potash; large quantities of potassium sulfate with a guaranteed minimum of 46 per cent pure potash, and finally, special syl-

vinite for the destruction of weeds, obtained by finely grinding the crude sylvinite and by adding 5 per cent of infusorial earth in order to keep it in the dusty state.

As concerns the potassic salts, the situation is particularly satisfactory, thanks to continuous increase in production, consumption and volume of export. The chloride of potassium and the sylvinite are in greatest demand. Prices are firm and doubtless will remain so for some time. In the first eight months of 1929, the extraction of crude salts was 2,017,000 tons, which represents 22 per cent above the quantities extracted during the same period of 1928. The production of marketable salts (sylvinite 12-16; sylvinite 20-22; chloride 30-40; chloride 50-60) for the same period reached 992,000 tons, or 219,000 tons of potash. This represents an increase of 23 per cent over 1928 and 28 per cent over 1927.

Increasing Phosphate Production

Production of crude phosphates is expanding in Tunis, Algeria, and Morocco. The Societe des Phosphates de Gafsa, in Tunis extracted in 1929 more than two million tons of phosphates, in 1928, 1.9 million tons. Morocco at present is supplying more than 100,000 tons a month. In 1928 the extraction of phosphates in Morocco amounted to 1.3 million tons. Out of the world's production of 10 million tons of crude phosphates France, including North Africa, produces half, i. e. five million. It is followed by the United States with 3.3 million tons. On the other hand, out of the 14 million tons of superphosphates manufactured in the entire world the portion of France is more than two million. France is passed by the United States with four million and it is followed by Italy with 1½ million, by Spain with 900,000 and Germany with 740,000 tons.

For the years 1927 and 1928 the following statistics are available for French phosphate fertilizers:

	Superphosphate			
	Production	*Importation*	*Exportation*	*Consumption*
1927.....	2,215,000	21,700	282,507	1,954,253
1928.....	2,350,000	8,200	260,000	2,110,000
	Slags			
	Production	*Importation*	*Exportation*	*Consumption*
1927.....	1,585,709	348	1,082,018	620,000
1928.....	1,800,288	2,418	1,027,682	708,500

The leading producers of superphosphates are Saint-Gobain, Kuhlmann, and the Societe Bordelaise de Produits Chimiques (370,000 tons a year). The centers of production are the Departments of the North, of the Somme, of the Aisne, of the Lower Seine. The number of plants producing superphosphates is estimated at 56, production, which stood at 1.92 million tons in 1914, attained 2.43 million in 1926, fell back to 2.22 million tons in 1927 and went up again to 2.35 million tons in 1928. Figures are still lacking for the year 1929.

The production and the consumption of sulfuric acid increase. In 1928 it was possible to record an increase of 50,000 tons. The major part of sulfuric acid, i. e. 75 per cent, is absorbed in superphosphates. It is estimated that the artificial silk industry, which is progressing right straight along, consumes from 40,000 to 50,000 tons a year and perhaps more, for the production of viscous silk (4 kilos of acid for one kilo of silk). Metal scouring likewise demands large quantities of sulfuric acid. Most of the steel mills utilize the residual waters in order to manufacture by the Charpy process sulfate of iron, which is used for disinfection and for the destruction of weeds. For this latter employment sulfuric acid is also in use: at 12-14 per cent or at 8 per cent, according to the season. Inasmuch as from 80 to 150 liters is spread per hectare, there is a means for extending this outlet considerably, in view of the fact that the wheat crop in France occupies more than nine million hectares.

The manufacture of nitric acid by ammonia avidation is also increasing. Saint-Gobain is discontinuing the manufacture of nitric acid from nitrates in order to produce it in Chauny from synthetic ammonia manufactured by its branch companies by the Claude process. The Societe Le Nitrogene has made an appreciable improvement in the nitric acid, arc process as regards the yield of the combustion of the atmospheric nitrogen.

The manufacture of sulfate of soda is on the decrease, glass-making passing over to the use of soda carbonate.

The recent merger of the Societe des Phosphates Tunisiens with the Societes des Engrais Azotes et Composes has brought a new development of the manufacture of phosphoric acid. The company installed in Pierrefitte-Nestalas the first plant in Europe manufacturing in four ovens of 50,000 kw. each phosphoric acid according to the processes of the Federal Phosphorus Company of Birmingham, Alabama. It produces phosphoric acid and phosphate of ammonia for fertilizers, commercial acid for chemical uses and a refined grade for special uses.

The monthly production of chlorates is estimated at 10,000 tons. This is consumed entirely in France and her colonies. The chlorates obtained by electrolysis are manufactured by the Societe Alais, Froges et Camargue who have increased production tenfold since 1921, and also by the Societe d'Electrochimie.

Larger Bromine Exports

Bromine is manufactured in quantities considerably exceeding the requirements of the home market, the residual waters of the Alsatian potash industry yielding 180 tons of bromide a year which may be increased. On the other hand the Societe Alais, Froges et Camargue produces 120 tons, so that the total production is 300 tons, 100 tons more than French consumption. The exportation of bromine is consequently on the increase.

The manufacture of synthetic methanol is expanding. Thus, the Compagnie des Mines de Bethune, which for the past two years has been producing 3,000 liters a day, has just doubled production and is

completing a new plant that will soon treble this output. Furthermore the Societe des Produits Chimiques Courrieres-Kuhlmann has recently come into operation and is faring well.

An important organic synthesis has been created conjointly by the Societe Le Ketol and the Societe Lefranc. This company manufactures butyrate of lime by fermentation of the saw-dust from saccharified wood, getting from it several new products. By distillation they obtain a mixture of ketones—"Ketol"—used as a solvent and proposed as a fuel for aviation. They also produce butyric acid which they export to Germany and sell to the tanneries. They also produce butyric esters and a new substance, butyro-cellulose, important for lacquers, artificial leathers, films, artificial silk. The Societe Le Ketol, founded in 1924, for exploiting the Lefranc patents, owns a plant in Ris-Orangis, producing six tons of calcium butyrate a day, half of which is distilled in order to give two tons of ketol. A plant in Catenoy, nearing completion, is to manufacture calcium butyrate and butyric acid, while the Ris-Orangis plant would produce exclusively ketol. The license covering the Lefranc patents has been sold in Austria, Hungary, Czecho-Slovakia and Poland. The Societe Le Ketol is also building a plant in Jugo-Slavia.

The production of benzol by the gas plants, the coke ovens and tar distilleries increased from 53,300 tons in 1926, to 61,200 tons in 1927 and to 69,200 tons in 1928. The million automobiles of France consume 1.4 million tons of oil, 40,000 tons of benzol and 20,000 tons of alcohol. The formation of the "Unibenzol" grouping of producers of benzol has contributed to the standardization of the benzol market.

The benzol recovery of coke ovens gas has been the object of special study and has been modernized by the Compagnie de Mines of Roche-la-Moliere and Firminy. Low temperature carbonization is making some progress. In 1929 several new factories have been started, using the processes of Illingworth, Laing and Nielsen (L. and N.), Kohlenscheidungsgesellschaft (K. S. G.), Salerni, and the French Hereng process. The large mining companies of the north have drafted a project for the establishment of piping gas to Paris, which would considerably lower the cost of gas there, but for the moment there is no chance of any successful consummation of this project.

Lacquer Consumption at 2,000 Tons

In keeping with the development of the automobile industry, the production and sale of varnishes and nitro-cellulose lacquers are in a period of growth. The yearly consumption of lacquers is estimated at from 1,500 to 2,000 tons, of which 70-75 per cent is absorbed by the automobile industry. The principal producers are the companies making use of the American Duco and Valentine processes, the Nitrolac exploiting an I. G. process, the Compagnie Francaise du Zapon, and a Dutch-French company connected with the Maison Lefranc for the manufacture of Ripolac. The use of nitro-cellulose lacquers is spreading to the railroads, where according to certain reports good results have been had in inside painting and even in outside painting, so that one may look forward to an increase of 25-30 per cent in the demand from this quarter in the course of the coming years. The building industry, the manufacturers of various objects of wood, of ebonite and plastic materials, also are becoming consumers.

The yearly production of turpentine spirits and gums has ranged from 1920 to 1930 between 25,000 and 32,000 tons of turpentine and between 90,000 to 117,000 tons of rosin.

Artificial Silk Progress

The development of the artificial silk industry is more and more accelerated. Whereas in 1926 production stood at 10,000 tons, in 1927 at 12,700 tons and in 1928 at 18,500 tons, it now reaches 25,000 tons. Capacity, which was 29,750 tons in 1928, has grown in 1929, as a result of the construction of new plants, to 40,000 tons. The official name of Chardone has been adopted for artificial silk.

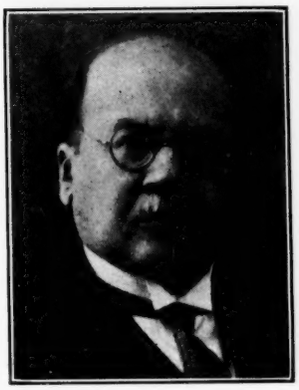
Exportation of artificial silk is estimated at 5,300 tons for the year 1928, as against an importation of 560 tons. The Societe Setyle Francaise, with a capital of 25 million francs, a branch of Bozel-Maletra, contemplates producing acetate cellulose silk by the Zdanovich process.

Among French mining extractions, it is well to note the spath-fluor, the important deposits of which lie in the section of the Central Plateau. The ore is very rich and reaches 85-98 per cent and more of calcium fluoride. This industry is in a growing state. Spath-fluor is exported in large quantities to the United States. The discovery of a mercury deposit is pointed out on the Franco-Belgian frontier, the largest part of it lying on French territory.

Among the activities of the scientific societies of France it is well to point out the beginning of the realization of the House of Chemistry, the Senate having voted a credit of 15 million francs for the purchase of real estate. The House of Chemistry will shelter the Chemical Society of France, the Society of Industrial Chemistry, the Associations of Sugar Chemists and Distillation Chemists, the Society of Biologic Chemistry, the Society of Physical Chemistry, the Society of Expert Chemists, the Association of Chemists of the Textile Industry, the National Federation of Associations of Chemistry of France, the National Committee of Chemistry, the International Union of Pure and Applied Chemistry, the International Office of Chemistry. The libraries of these Associations will be merged into one single one and a common organization for information and translation will be created.

German chemical developments show mixed trends in industrial progress of past year

By Walter Roth
Editor
Chemiker Zeitung (*Kothen*)



GERMANY is poor in raw materials. Its only large natural resources are pure salts and coal of various kinds. This accounts for the great importance of the chemical industry for Germany, an importance which the difficult post-war period has only helped to accentuate. This also explains why the German chemical industry has developed so extensively and why it had necessarily to grow and expand. The growth of the industry was further promoted by the fact that its leaders, (pupils of great figures in German chemical research, like Liebig, Hofmann and Bayer) have kept contact with science and spared no expense in tedious experiment, often expending millions to carry through chemico-technical processes.

Estimates for 1929 set German chemical exports at about 1,450,000,000 M. Disturbed conditions in Germany since the war have made exports more imperative for that country than ever. Only the textile industry outranks the chemical industry in exports. Chemicals are therefore, a leading factor in improving Germany's balance of trade. Something like a third of the country's total production in chemicals goes into export, and the following table will bring into relief the part played by the chemical industries in Germany's foreign trade:

	Exports		*Imports*	
Year	*in Millions of Marks*	*In % of total German Exports*	*in Millions of Marks*	*In % of total German Import*
1913	860	9%	435	4 %
1925	962	10%	185	1½%
1926	1,062	10%	177	2 %
1927	1,190	11%	285	2 %
1928	1,319	11%	303	2 %
1929	1,450	11%	300	2 %

Estimates for the year 1929 show the following approximate figures for German exports of chemicals in millions of marks:

Heavy Chemicals	550
Nitrogen	335
Coal-tar dyes	220
Pharmaceutical products	130
Mineral dyes	105
Artificial silk	95
Photographic paper, films, plates	60
Celluloid and other artificial cloths	30
Explosives and Inflammable Materials	25
Varnish, lacquer, Luting Materials	26
Ether, Oils and other Artificial Perfumes	22
Cosmetics	15
Glue and Gelatine	19

German prices for chemicals are naturally higher than in 1913, but compared to the higher price levels for other goods (index figure 150), the increase is only a slight one. The index figures in gold, taking 1913 as 100, show the average of prices for chemicals in Germany to run as follows:

1926	*1927*	*1928*	*1929 (estimate)*
120	119	119	119 Reich-Marks

The following gives a comparative table of prices on chemicals in other countries, on a gold index basis:

	1926	*1927*	*1928*	*1929 (estimate)*
Great Britain	141	144	144	144
France	0.96	113	112	120
United States	132	135	135	135

Prices of nitrogen fertilizers, for example, are over a third lower in Germany to-day than they were in 1913, a very helpful factor for the impoverished farmers, who have thereby been able to increase their consumption from 165,000 tons of pure nitrogen to over 400,000 tons.

In November 1929 prices on 1 kilo of nitrogen in terms of Reich-Marks stood as follows:

	Nov. 1929	*Nov. 1928*
Sulfate of Ammonia	0.84	0.89
Chloride of Ammonia	0.80	0.82
Lime ammoniac, DAVV	0.83	0.87
Calcium Cyanamide	0.81	0.83
Leuna-Saltpetre, BASF (Ammonium Saltpeter)	0.87	0.89
Montanic Saltpetre, DAVV (Ammonium Sulfate Saltpetre)	0.87	0.89
Ammonium Potash Saltpetre, BASF.	0.87	0.89
Lime Ammoniac Saltpetre, IG.	0.89	....
Urea, IG, bags included	1.04	1.13
Soda Saltpetre	1.14	1.23

Nitrophoska IG-1 costs M. 25.50 per 100 kilos net, Nitrophoska IG-2 costs M. 24. Recently Nitrophoska IG-3 has begun to be prepared with a somewhat different composition. The minimum of nutritive elements contained is as follows: 16.5 per cent Nitrogen (as heretofore), 16.5 per cent water soluble phosphoric acid (instead of 15.2 per cent of water-soluble and 1.3 per cent citrate and citric acid-soluble phosphoric acid), 21.5 per cent potash (instead of 20.0 per cent.) The price for the new Nitrophoska IG-3 is naturally higher in proportion to the added potash content, and has been set, until further notice, at M.25.90 per 100 kilos net. All these prices are for deliveries in carload lots.

On December 31, 1928 there were in Germany 11,690 corporations with a nominal capital of 22,885,000,000 Reich-Marks. The chemical industry accounted for 550 of these corporations, with a nominal capital of 2,184,000,000 Marks. The total capital of unincorporated German chemical enterprises (such as "limited" companies and partnerships) is estimated to be in excess of 1,000,000,000 Marks. The latest industrial census taken in Germany, in 1925, showed 8636 chemical factories employing 313,561 workers and office employees and an inherent mechanical force of 946,567 H. P. Of all those engaged in industrial occupations, 2.5 per cent were in the chemical industry, and of the total capacity of all machine power installed in the manual trades and in industry generally, some 5 per cent was in chemical plants. Though these figures appear rather slight at first blush, it must be remembered that the chemical industries, unlike many another, require only a small amount of man and motor power.

German Exports and Tariff Barriers

Like the rest of German industry, the chemical trades suffer from reparations' deliveries, from high overhead, "social" levies, and, particularly, from the high tariffs in foreign countries. The rates in those countries where chemicals might be exported are anywhere from four to twenty times as great as German tariffs. This is a contributory reason why Germany's chemical exports have fallen and, indeed, the chemical trade the world over, as well as progress in industrial chemistry generally, is being hampered by these artificial tariff barriers, a condition making it highly desirable that the resolutions arrived at by the International Industrial Conference of the League of Nations, held at Geneva, May 4-25, 1927, be put into speedy effect.

German chemical industries have in the last few years been put on a still better paying basis by the introduction of rationalization methods and by mergers, dividends or profits for the period from April 1, 1928 to March 31, 1929 amounting to an average of 5 per cent for the chemical corporations, and to 7.7 per cent for the period from July 1, 1927 to June 30, 1928. But in connection with this improvement (1927-28 7.7 per cent as against 6.7 per cent for the other large German corporations generally), it should be borne in mind, as already hinted, that the risks in the chemical industry are particularly great on account of the rapid technical progress.

I. G. Largest Non-Government Institution

The largest non-governmental institution in Germany is a chemical firm, I. G. Farbenindustrie A G., having a gross capital of 1,100,000,000 R.M.* The last statement issued by this company, that for the third quarter of the year 1929, indicates a further favorable development in dyes, nitrogen, synthetic gasoline, chemicals, solvents, medicaments, photographic materials, etc. Nothing is said with regard to large-scale manufacture of synthetic rubber. An important event of the year was the recent agreement between the I. G. and the Vereinigten Glanzstoff-Fabriken A. G., on viscose rayon, intended as a preliminary step toward a general entente that is to encompass all the other leaders, both domestic and foreign producers, who are factors in the German market.

An agreement was likewise entered into with the Standard Oil Co. of New Jersey on the hydrogenation of coal. A joint company has been organized with Standard Oil in charge, but a special agreement covering the gasoline (benzine) produced by the "I. G" for the German market, under terms that protect the interests of the German company. Negotiations are under way between the "I. G." and the Ruhr mining interests with a view to stopping the erection of new nitrogen plants in line with the international agreements successfully broached in the course of 1929.

The total sales of nitrogen by the producers who constitute the Stickstoff-Syndikat are figured as 663,000 tons for the fertilizer year 1928-29, an increase of 55,000 tons over the previous year's deliveries. The proportion of this which the "I. G." accounted for was given as 70 per cent. At the present time the Ruhr mining industries are putting out some 83,000 tons, an amount expected to grow to about 160,000 tons within the next six months. Several new nitrogen plants are expected to start early operations, namely one in Oer-Erkenschwick under construction for the Ewald Gewerkschaft,

a subsidiary of the Ruhr Chemie A. G., and another called King Ludwig, to work the Nitrogen Engineering Corp. process. In this connection, there is used, in order to obtain the sulfur from the coke furnace gas, in converting the synthetic ammonia into sulfate, the so-called C. A. S. process of the Heinrich Koppers A. G. This process, related to the older experiments of Walter Feld, removes from the coking gas not only the ammonium and hydrogen sulfide but also the cyanogen, hence the name C. A. S. (Cyan-Ammonium-Sulfur) process.

By this process the raw gas produced in coke manufacture is cleansed of its tar in the usual manner; then the ammoniacal liquor is separated off from the tar and reduced in a special concentration apparatus to an ammonia content of from 8 to 12 per cent. Following that, the gas is let pass through a suitable purifier where liquors are permitted to trickle through, so as to remove the ammonia, the cyanogen, and the hydrogen sulfide. A part of liquors is regenerated in a special vessel, while the rest is treated with sulfurous acid and converted into polythionates or into sulfates. By the use of autoclaves, the polythionate liquor is broken up into sulfite of ammonia and free sulfur. The latter is drawn off in a heated state and the 50 per cent heated sulfate liquor is evaporated down to a solid salt and dried in centrifugals. A portion of the sulfur thus obtained is used in the continuance of the process, in the form of sulfurous acid, while the remainder is put on the market for sale. If the coal used is poor in sulfur, the gases have to be enriched with hydrogen sulfide in an iron pyrites roaster.

The New Tern Process

In this connection, we should make brief mention of the electro-nitrogen-process of Dr. Tern used by the Thuringer Gas-Gesellschaft of Leipzig. One plant in operation is that of the Gaswerk Engelsdorf near Leipzig. This process, intended primarily for gas plants, likewise separates out the sulfuric acid, and for the purpose obtains sulfur trioxide from the mass used for gas purification. This mass is roasted in an oven, and the sulfur dioxide produced is made into sulfur trioxide under the action of a luminous arc, and the trioxide, together with the liberated ammonia gas, passes through an electric filter, whence it is precipitated as ammoniac (electro ammoniac). Both in the C. A. S. and in the electro-nitrogen process a saving of 90 to 100 Marks is claimed in the cost per ton, thanks to avoiding the use of sulfuric acid, which has become so costly. The German chemical industry in 1928 imported 30,000,000 M. (in 1927 some 19,000,000 M) worth of iron pyrites for the manufacture of sulfuric acid. Altogether there were produced in 1927, 1,447,800 tons of sulfuric acid (monohydrate), which still holds its own as the basis of every chemical industry, 68 factories being engaged to manufacture it from 1,011,300 tons of iron pyrites, 202,900 tons of zinc blende, 148,700 tons of other sulfuric ores and rocks, and finally 62,900 tons of other sulfur containing materials. As yet no thought is being given to the practical utilization of the sulfur in gypsum, though this raw material is available in large quantities in Germany.

The Year's Nitrogen Developments

The new nitrogen plants in the Rhine-Westphalian district are based on the splitting of coke furnace gas by the Bronn-Linde Concordia process for obtaining hydrogen and nitrogen, which are then united by diverse methods to form ammonia. According to Dr. J. Bronn, purified coke furnace gas comprises 50 per cent hydrogen, 13.5 per cent nitrogen, 7.5 per cent carbon monoxide, 0.8 per cent oxygen, 25 per cent methane, 1 per cent ethylene, 0.5 per cent ethane, 0.03 per cent acetylene, 1 per cent propylene and 0.5 per cent propane and butane. The Concordia Bergbau A. G. (Concordia Mining Corp.) has been producing these gases since 1921 by the use of an apparatus created by the Ges. fuer Linde's Eismaschinen A. G. Since the Belgian firm of Semet, Solvay and Piette (now the Union Chimique Belge) adopted this method in 1924 in conjunction with ammonia synthesis, it has recently come into use on a large scale in Germany by the Mont Cenisin Sodingen, in Herne, (capacity 20,000 cu. m. of coke furnace gas per hour), by the Gasverarbeitungs-Ges. (Gaveg), by the Hibernia A. G. at its mine Shamrock IV, by the Ruhrchemie A. G. in Holten be Sterkrade and at Castrop-Rauxel at the Victor mine of the Kloeckner A. G., being adopted in all these places for the purposes of ammonia synthesis. A similar plant in Meiderich, likewise using coke furnace gas, is engaged in liquefying hard coal by the Bergius method. According to the Union Chimique Belge, the actual consumption of coke furnace gas is estimated at 1.2 lbs. per cubic meter of hydrogen, and total operating expenses, including power and other production costs, are given as 2.9 lbs. per cubic meter of hydrogen. The hydrogen so obtained is ready without any further treatment for catalysis purposes. Accordingly, inquiries are being pursued into how to utilize properly the methane, ethylene and other hydrocarbons, obtained in such large quantities by this method, untainted with sulfur compounds. Dr. J. Bronn has in mind using methane as an automobile motive fuel. One cubic meter of methane is the equivalent in use of 1 kilo of gasoline. The by-product recovery coke plants in Germany are able to turn out yearly over 100,000,000 cu. m. of methane, or the equivalent of about 100,000 tons of gasoline. Lord Melchett has denied that there is any money in processes for the decomposition of coke over gas to obtain ammonia by catalysis. But in opposition to this view, Prof. Dr. H. Grossmann (2) and General Manager Battig (3) point out the economies of such ammonia processes

as include the Claude method (up to 1,100 pressure), the Casale method, etc.

Instead of gaseous oxygen, Dr. Heylandt, recently recommends liquid oxygen, which can be just as cheaply produced, since the gas has to be compressed in steel containers.(4) The avoidance of expensive steel containers and their handling means great economy and advantage, while, in addition, the gas formed from liquid oxygen is completely water-free and extremely pure.

Apparatus Hinders Soda Caustic Process

In recent years there has been much talk in Germany about the process of the "Ring" Ges. chemischer Unternehmungen, of Hanover, but accounts of same have been made public only recently.(5) The process has to do with the manufacture of soda, or caustic soda, from common salt and calcium carbonate, or of caustic lime with the help of fluorine compounds as intermediate products, which keep constantly being regenerated. There are still mechanical deficiencies to be corrected in the apparatus, while the economic feasibility of the whole process has yet to be demonstrated.

This question of proper and suitable apparatus has always been important in chemical industries. Thanks to perfecting new materials with increased resistance to air, acids, alkalis, rust, etc. (light alloys, Krupp steel, bush metals, bronze, Haveg products, etc.), and to an increased resistance of apparatus to high pressures and elevated temperatures the newer chemical processes have been rendered possible in a practical way.

One such newly perfected material now being highly recommended is double, a metal combination produced by pressure welding.(6) The "Eika-Bimetall" has proved of value in many branches of the chemical industries, in the rectification of chemically pure distillates, in the preparation of organic preparations, sterile solutions, etc.

Beryllium Production Not Perfected

In recent years progress has likewise been made in the study of beryllium and its alloys.(7) A ton of beryllium has already been produced by Siemens & Halske, but the hopes staked on its use as a light metal have not yet reached fruition, although beryllium bronzes have been found useful for many purposes on account of their hardness, resistance, and electrical adaptability, proving to be even better than the aluminum-phosphoric-bronzes. The price of beryllium is about 1 R. M. per gram.

Siemens & Halske have recently extended their zinc electrolysis activities. Over 21 per cent of the total zinc production of the world is now made by zinc sulfate electrolysis. In Germany, as is well known, a large zinc electrolysis plant is being put up near Magdeburg.

If we pass beyond the borders of chemistry into metallurgical processes, we shall have to make brief mention of potash, one of Germany's most typical industries, which has successfully gone forward with its rationalisation program during 1929. A thorough study of the potash industry has recently been published.(9) From January to October, 1929, the works comprising the German Potash Syndicate delivered 12,171,660 double centner of pure potash as against 12,317,723 double centner in the period January to October, 1928. Likewise the German superphosphate industry, which with only about 40 factories is providing a mere 660,000 tons of superphosphate out of a world-wide production of over 14,000,000 tons annually, is seeking a rebirth (10) and toward that end inaugurated the first Superphosphate Exposition in Berlin on January 28, 1929.

Chemico—Industrial Conferences

The calendar in 1929 was dotted with conferences on chemistry and the chemical industry. Critics may scoff at such conferences, but they offer the opportunity for a closer contact between scientists and industrialists, between experimenters in the laboratory and in the plants; and they have now become quite indispensable.

Let us mention as highlights in the year's progress in chemical science numerous new medicines (most of them "fly-by-nights"), new, improved and cheaper methods for producing such chemicals as adipine acid, acridine (12), anthraquinone (13), chemical achievements like hemin synthesis, produced by Dr. Hans Fischer (14), the isolation of parahydrogen (15), the production of rhenium .(16)

The times may be sluggish, but in chemistry there is abounding life. It is the destiny of this science that whenever any natural product threatens to reach exhaustion, chemistry will step in and find the necessary substitute. And among those nations engaged in the science, Germany is bound, so long as she continues to work on these questions in that same spirit as now pervades her scientific and industrial leaders, to hold her own in the very foremost rank.

2. Chem. Ztg. 1929, p. 661-663.
3. Technical Papers, Deutsche Bergwerks-Zeitung, 1929, No. 29.
4. See M. Laschin, Liquid Oxygen, publ. by Carl Marhold, Halle 1929.
5. See Dr. W. Siegel, Chem. Ztg. 1929, p. 145-146.
6. See G. Durst, Chem. Ztg. 1929, p. 837.
7. See A. Stock, "Scientific Publications by the Siemens Trust" 1929, vol. 8; also Chem. Ztg. 1929, p. 417.
8. See Dr. G. Eger, Chem. Ztg. 1929, p. 857 and 878.
9. E. S. Mittler & Sohn, Berlin, publishers.
10. Memorial Statement of the Deutsche Superphosphate-Industrie Ges. m. b. H., Berlin, W. 10, Sigismundstr, 7.
11. Chem. Ztg. 1929, p. 41.
12. " " " p. 237.
13. " " " p. 258.
14. " " " p. 71.
15. " " " p. 289.
16. " " " p. 872.

Italian chemicals

By Dr. Massimo Treves
Director, L'Industria Chimica

industrialists seek solution of raw material problem in order to make their operations independent of imports and allow an exportable surplus of

IN THE year 1929 Italian industry records further noteworthy progress alike in processes and in both quantity and quality of the chemicals produced. These achievements are the more noteworthy since the industry has had to contend with numerous special difficulties that arise as a consequence of the dearth of the raw materials. They afford the hope of its steady development and its increased security of existence.

The intensification of agricultural production has caused increased consumption of superphosphates, and the national industry has made considerable efforts to free the country from the necessity of importing fertilizing materials and preparing them in sufficient quantity for future needs.

The world's production of phosphatic fertilizers in 1928 was about 13,000,000 tons, with Italy second among European producers and third in the world.

Growing Superphosphate Industry

In September, 1929, the superphosphate industry employed 7,570 workers, and its production for the first nine months of the current year was 9,386,707 cwt., with an increase of 1,112,199 cwt. over the production of the same period of time of the previous year (8,274,508 cwt.)

The production of mineral superphosphates began in Italy in 1875. By 1880 two factories were operating with 14 others arising from 1880 to 1890, 30 from 1890 to 1900, while in 1910 the number had gone up to 82, and to-day there are 86 factories. The "Montecatini" Company itself has applied more than half of Italian consumption for the mining industry and agriculture.

The increasing need for superphosphates has naturally given rise to increased production of sulfuric acid. Immediately prior to the world war yearly production of acid 50°-52° Bé amounted to about 6,000,000 cwt., of which about 5,000,000 found employment in the manufacture of superphosphates and 1,000,000 cwt. were in part concentrated at 66° Bé and in part consumed in various industries. In 1918 the production of sulfuric acid reached 4,655,000 cwt., in 1924 at 8,600,000, in 1927 at 11,241,200. However, the establishments have gradually been introducing all the improvements suggested by science, and their productive capacity is able to assure Italy all its needs.

Utilization of Pyrites Resources

The sulfurous anhydrid needede for the manufacture of sulfuric acid is obtained almost exclusively from pyrites, of which vast deposits exist, more particularly in Tuscany. The Italian production of iron and copper-bearing pyrites was 552,430 tons in 1928, and notwithstanding a not inappreciable amount of this material that is imported from Spain, on account of advantages in transportation and for the particular requirements of some establishments, exportation reached the heavy figure of 187,842 tons. At this juncture it is well to point out the large use made in Italy of the pyrite ashes, which have always constituted a cumbersome waste material from the manufacture of sulfuric acid. With a most modern plant, constructed in the establishments of Marghera, the "Montecatini" proceeds with the roasting of the pyrite ashes to render them fit for the manufacture of pig iron. As secondary products glauber salt and sulfate of copper are obtained. Italy to-day is the heaviest producer of copper sulfate. The manufacture of this product, for which Italy used to be entirely dependent upon England, was begun in 1894 with a production of 29,810 cwt. In 1928 the production attained the huge quantity of 1,000,000 cwt., divided

among eight active establishments, which have a productive capacity of 1,500,000 cwt.

It is interesting to compare in the following table the data covering production, importation and exportation collected from 1920 to 1928:

PRODUCTION, IMPORTATION AND EXPORTATION of Sulphate of Copper from 1920 to 1928 (Cwt.)

Years	*Production*	*Importation*	*Exportation*
1920	889,700	8,570	57,710
1921	953,500	8,120	29,000
1922	840,000	39,490	16,800
1923	920,000	37,640	28,680
1924	895,000	49,870	28,690
1925	831,900	96,850	65,020
1926	929,240	82,380	80,860
1927	1,003,000	127,995	108,256
1928	1,000,000	155,920	98,490

Calcium cyanamid was first manufactured in Italy in 1905 when the establishment of Piano d'Orte was founded, which operated according to the Frank-Caro patent. The establishments of Collestatte (Terni), of St. Marcel (Valle d'Aosta), of Ascoli Piceno and of Domodossola subsequently entered the field and production (expressed in nitrogen) which in 1906 turned out at 3,500 cwt. was 780,000 in 1928.

Sulfate of ammonia production increased from 65,400 cwt. in 1919 to 1,200,000 cwt. in 1928, a production that permitted the exportation of 211,780 cwt.

At the end of 1928 the productive capacity in nitrogen of Italy was as follows:

With the process of synthetic ammonia (1)	Tons 40,000
With the cyanamid process	18,500
Sulfate of ammonia as by-product	3,500
	Tons 62,000

Consumption was 34,900 tons.

Following the termination of the war the problem of synthetic nitrogen was successfully solved by two young Italian students who attached their name to one of the most ingenious and most useful applications of chemistry; i. e., the process devised by the lamented Luigi Casale and that proposed later by Giacomo Fauser, which have such merits that they are now adopted in Sweden, Poland, Belgium, Japan, and Germany.

(1) In the various plants of Novara, Terni, Mas, Nera Montoro, Merano, Bussi, Cotrone, and Oschiri, Valdo Ligure.

To complete the fertilizer outline we must not forget potash. At the present time a great plant is nearing completion in Tripolitania for the utilization of the natural salt mines of Bu-Kamash (Oisida), which cover an area of over 50 square kilometers. By a process of Dr. Niccoli, for utilizing solar heat it will be possible to obtain potassium sulfate of a purity of 92-94 per cent, while by interrupting the evaporation at the proper moment the salt may be had with a purity of 99 per cent. This process takes on outstanding importance since in the first phase of the manufacture an important production of magnesium sulfate is had, which is used in enormous quantities in the artificial silk industry.

A second source for the potash required by Italy is now assured by the utilization and elaboration of leucite according to the ingenious process devised by Prof. Baron G. A. Blanc. There will thus be obtained potassic salts and a variety of very pure alumina, which will permit of the economical production of aluminum in a state of great purity. A vast plant is under construction near Civitavecchia, which will put out about 20,000 tons of leucite a year, but the capacity will be gradually brought up to beyond a million tons. The supply of potash will thus be far greater than the needs of Italy. And with potash, aluminum will be had in such quantities that Italy will rank among the largest producers of this most useful metal.

In Italy the alcohol factories are divided into two classes, the large distilleries that work on molasses, beets, and grains being classified in the first category and in the second the small distilleries that work on wine, dregs of pressed grapes, and fruit.

The production of alcohol is steadily on the increase, as appears from the table below.

There are about thirty factories of the first category throughout Italy. Those of the second category are extremely numerous, being small plants of agricultural character with limited production. Italy by its heavy production of alcohol has solved technically the use of alcohol itself as a carburant for combustion motors,

PRODUCTION OF ALCOHOL IN ITALY

Financial Year	*1900-01*	*1905-06*	*1910-11*	*1915-16*	*1920-21*	*1927-28*
1st Category						
Material Distilled Grains	132,931	47,278	64,934	45,007	49,263	60,458
" " Molasses	8,333	108,862	154,195	153,234	172,085	332,806
" " Beets	.....	3,231	8,858	17,870	.....	.....
" " Miscellaneous	.....	1,174	4,967	14,503	33,731	13,542
Total Alcohol in Edri	141,264	160,545	232,054	230,614	355,079	406,806
2nd Category						
Material Worked Dregs of Pressed Grapes	51,640	75,817	46,698	24,051	59,411	48,644
" " Wine	1,850	20,711	16,436	859	2,275	713
" " Miscellaneous	179	442	1,479	6,992	11,876	2,904
Total Alcohol in Edri	53,669	96,970	64,613	31,902	73,562	52,261
Sum Total Edri	194,933	257,515	269,667	262,516	428,641	459,067

and it is to be hoped that an economic solution will not be long forthcoming.

Hand in hand with the alcohol industry the tartaric industry is thriving. It exports about two thirds of its total production. Statistics of 1927 recorded an export figure of 34,629 cwt. Three firms (among which the "Appula" holds preeminent position) are engaged in this industry, and recently they merged into a National Consortium, under the name of "Italtartar," thus completing the rationalization of the industry. With the advantages accruing from unity of management there is every confidence in an increased prosperity in this line.

Citric Acid Consolidation

The citric acid industry emerged in Italy in 1911 and the first establishment saw the light of day in Palermo. In 1926 there were four establishments, three in Sicily and one in Lombardy, with a production of 19,000 cwt. of citric acid, but with total potentiality of about 50,000 cwt. Exportation of citric acid was 27,759 cwt. in 1925; 20,613 in 1926; 20,015 in 1927 and 33,376 in 1928. In 1928 the Consorzio Italiano Fabbriche Acido Citrico (C. I. F. A. C.) was formed, with headquarters in Messina, which has concentrated production into two factories only, one in Palermo and the other in Tremestieri.

Forty establishments in Italy are engaged in the tanning extract industry. They work on extract of discolored and solubilized quebracho, sumac, myrobolan and others; but the greatest production is from the extract of chestnut, obtained from domestic wood. The tanning extract industry keeps 1,500 operatives busy and the yearly production revolves around 900,000 cwt. calculated reduced in liquid with 30 per cent tannin, but the effective potentiality would permit of the attainment of 120,000-130,000 tons. The tanning industry at the end of September, 1929, employed 10,922 workers in 330 establishments in which census was taken.

Boric Acid Production at 34,000 Cwt.

An industry of special importance for Italy is the boric acid industry, which is thriving in Tuscany, and which employs about 800 workers distributed among eight establishments belonging to the Soc. An. Boracifera of Larderello. Boric acid is extracted nowadays according to perfected processes from the vapor of "blowers" and is put on the market in crystals, flakes, or impalpable powder with a fineness of 99.5 per cent. Yearly production hovers around 34,000 cwt. and in 1928 the following quantities of it were exported.

	Cwt.	*Lire*
Crude Boric Acid (United States and Greece especially).....	3,213	757,747
Refined Boric Acid (United States, England, Holland (especially).....	10,082	2,726,764

The Societa Anonima Boracifera of Larderello also produces borax and superchlorate of sodium.

The consumption of gas is on the increase and to-day about 100 million cm. more is consumed than before the war.

Coal Distillation Increasing

Although Italy commands quantities of domestic fossil fuels, in the major part represented by lignites and in lesser quantities by anthracite, bituminous schist and peat, importation of coal is heavy. Coal distillation is done in Italy by about 190 gas plants, and by four firms with six establishments and 638 ovens for the production of metallurgic coke. Part of the principal gas plants are also engaged in debenzolating gas, and the light oils are in turn worked upon to obtain benzol and toluol, or else, properly rectified, they are used as carburants. The following table indicates the steady increase in the output of the products:

	Light Oils from washing		*Tar Oils*		*Mineral Pitch*
	Gas	*Light*	*Medium*	*Heavy*	*Anthracenic*
1924.....cwt.	12,900	3,550	14,000	42,600	200,000
1925..... "	33,450	4,250	37,700	58,200	264,000
1926..... "	38,430	7,200	55,000	74,000	337,000
1927..... "	47,430	7,850	54,600	86,600	320,000

From these are obtained:

	Benzol Rectified	*Phenol Pure*	*Phenol Crude*	*Naphthalene Purified*	*Antracene Crude*
1924.....cwt.	4,700	1,230	145	10,950	4,000
1925..... "	11,130	1,620	150	25,300	3,700
1926..... "	14,830	1,750	160	19,500	1,550
1927..... "	13,900	3,040	365	18,000	2,160

In addition to this production, the following quantities have been imported: (All figures in cwt.)

	Tar Oils		*Benzol-Toluol-Xylol*	
	Light	*Others*	*Crude*	*Pure*
1924.....	98	34,052	9,441	31,960
1925.....	2	42,235	9,288	24,702
1926.....	152	79,992	12,064	28,815
1927.....	469	155,569	20,838	24,167
1928.....	72	142,038	27,436	25,730
	Phenol		*Naphthalene*	
	Crude	*Pure*	*Crude*	*Refined*
1924.....	2,002	1,700	8,930	11,308
1925.....	1,903	1,649	15,020	10,426
1926.....	1,129	1,448	2,688	6,494
1927.....	1,292	679	163	635
1928.....	4,878	2,107	11,595	1,064

The imports of tar in 1926 were 26,462 cwt.; in 1927 11,691 cwt.; in 1928, 11,944 cwt. On the other hand exports from 8,066 cwt. in 1927 went up to 16,640 cwt. in 1928.

The many plants that arose during the war for the production of explosives were transformed for the preparation of intermediate products, thus laying the foundations for a dye industry for which Italy used to depend entirely upon abroad.

Output of intermediate products rose from 1,707,500 kilos in 1922 to 4,500,000 kilos in 1927.

The products manufactured are numerous, including Chloro-benzol and its derivates, betanaphthol (250,000 kilos), aniline oil (1,000,000 kilos), para-nitro-aniline (150,000 kilos), benzidine (250,000 kilos), alpha-naphthilamine, scale acid, naphthionic acid, sulfo-anilic acid, acid of Cleve, of Dahl, of Freund, etc. However, the H acid deserves special mention, having attained a production of 350,000 kilos a year.

The manufacture of coloring materials has kept pace with the development of the manufacture of intermediate products. We give below a table in (kilos) reproducing the data of production, importation and exportation of coloring materials from 1909 to 1928:

Year	*Imports*	*Exports*	*Production*	*Consumption*
1909.....	6,116,500	70,900	.....	6,045,600
1913.....	.....	.....	.....	.....
1914.....	5,263,000	67,700	1,001,700	6,196,800
1918.....	.....	.....	.....	.....
1919.....	1,998,400	150,800	3,968,000	5,815,600
1920.....	4,117,000	349,400	2,003,000	5,770,600
1921.....	2,918,700	270,600	3,593,000	6,241,000
1922.....	2,487,700	169,000	4,906,000	7,224,700
1923.....	3,243,500	282,500	5,580,000	8,541,000
1924.....	2,736,900	245,800	5,645,000	8,136,000
1925.....	2,203,100	193,600	6,900,000	8,909,000
1926.....	1,530,500	309,000	6,987,500	8,209,000
1927.....	1,461,000	281,500	6,160,000	7,338,500
1928.....	1,908,700	361,503	.....	.....

In the production of vat colors satisfactory results have been attained. In 1926 the manufacture of synthetic indigo was commenced with a plant of a productive capacity of 6,000 kilos a day, and with the manufacture of synthetic indigo other products of very great importance, such as monochloroacetic acid and trichloride of ethylene, have come to enrich Italian chemical industry. The principal concerns manufacturing intermediates and coal-tar dyes are to-day united under the name of Aziende Chimiche Nazionali Associate (A. C. N. A.).

Growth of Artificial Silk Industry

The companies producing artificial silk number fourteen. The capital invested is above two billion Italian Lire. During 1929 two new companies (Tubize Francaise and Rodhiaseta) began two new plants for the manufacture of acetate silk, while La Soie de Chatillon on its part began production on a broad scale of silk itself in one of its establishments. The artificial silk industry employs 38,793 operatives with an approximate production of about 30 million kilos, while exportation comes to around 19 million kilos.

On the whole, Italian artificial silk industry in 1929 kept up the activity of the previous year with a further increase in production and in exportation.

In 1926 the production of crude iodine was begun from the waters of Salsomaggiore, and the extraction plants will shortly be such as to enable the country to dispense with the importation of this product. Italy has also finally emancipated itself as regards bromide. The new Italian Bromine Company formed in Rome in 1928, after having obtained the concession covering the utilization of the mother waters of the Salt Mines of the State Monopolies has set up the first establishment in Margherita di Savoja (Foggia), the most important state-owned salt mine in point of output and up-to-date equipment. The mother waters of this salt mine contain about two kilos of bromine per cubic meter. With the work under way for the enlargement of the salt mine itself there will be about 200,000 cm. of mother liquor available and the potentiality of the bromine production is readily understood. Besides the production of bromide, the company plans the erection of the plant for the production of bromines for pharmaceutical and photographic purposes and of other derivates of bromine.

Bromine Output Meets Domestic Needs

The production of bromine at the present time is 30,000 kilos a year, which amply covers the domestic needs, but with the greatest facility it will be possible to increase production considerably according to requirements.

We now have Italian production of caustic soda, carbonate and bicarbonate of soda. Also factories of synthetic hydrochloric acid, acetic acid, acetone, methylic alcohol, formaldehyde and formic acid, and neither is there to be overlooked the industry of colors and of varnishes, the industry of creams and polishes and of inks, the industry of plastic materials, of sodium sulfide, of bichromates.

The following are the quantities and values of the goods imported and exported from January 1 to September 30, 1929, on products that more directly bear upon the chemical industry:

	Importation tons		*Exportation tons*		*Importation million lire*		*Exportation m. lire*	
	1929	*1928*	*1929*	*1928*	*1929*	*1928*	*1929*	*1928*
Seeds, oleaginous fruits, oils and greases, waxes.	375,508	335,206	132,715	127,406	739.7	749.1	294.4	157.5
Textile materials, artificial silk and fallings.....	485,865	367,566	14,194,486	11,475,509	22.6	17.8	393.3	359.4
Metallic minerals, metals and their products...	1,738,666	1,376,098	689,435	547,665	2,563.2	2,193.9	888.2	900.9
Chemical products, medicinal products, and materials for tanning and dying.....	1,318,324	1,184,808	181,899	174,339	1,278.6	1,191.9	500.6	473.8

NATURAL vs. SYNTHETIC

Is the old industry automatically doomed by the appearance of a new synthetic process for chemical manufacture, or, has it the economic "edge" in the struggle?

WHENEVER a new, or supposedly new, synthetic process for the chemical manufacture of a product previously derived from natural sources appears it is almost always the signal for a flurry of speculation as to the fate of the old industry. The usual impression seems to be that where the chemical process has so far developed that the product is apparently successfully marketed in competition with that from the old source or sources, the days of the latter are numbered.

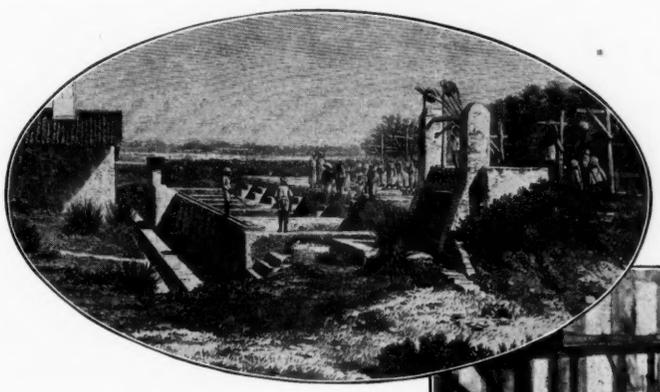
That this has been true in some instances is by no means an indication that it is always true.

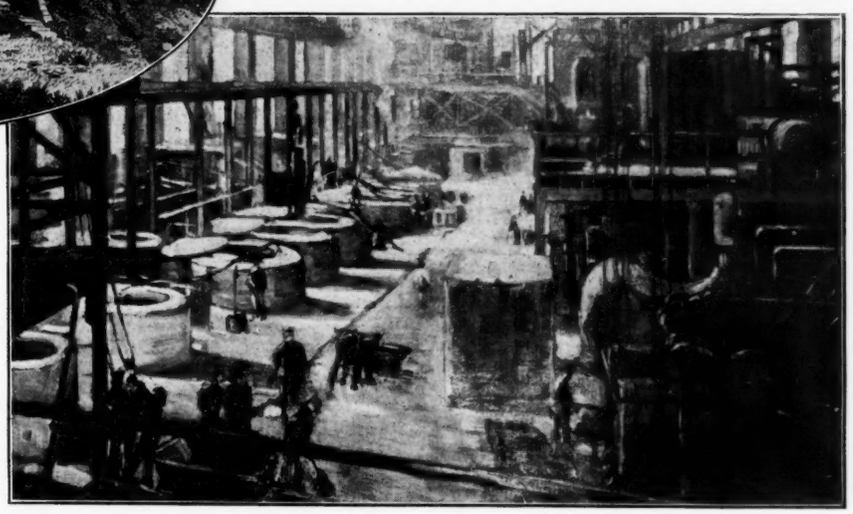
The opening of a new source of supply certainly indicates one thing—that serious price fluctuations will thereafter be kept strictly in check. Assuming the new method to be an efficient one, the factors in the old method determining the success of the new are its efficiency and the margin of profit to be expected in the face of new competitive material. A few examples will serve to illustrate the point. First, consider two outstanding triumphs of chemical over natural methods—indigo and methanol.

For a great number of years indigo had been produced from a plant grown mainly in India and Southern France. It occurred in this plant only to the extent of one or two per cent, and was liberated from it by a fermentation or chemical hydrolytic method. The compound thus obtained was generally impure and non-uniform in quality. After laborious years of expensive investigation the structure and then the commercial synthesis of indigo were worked out. At present natural indigo supplies only an infinitesimal proportion of the demand.

Without slurring the really beautiful work done in the chemical solution of the problem, consider the important elements contributing to the success of the synthetic material.

Little or nothing had ever been done to increase the coloring matter or the size of the plant, or to govern cultivation to obtain the maximum yield of indigo per acre. In other words, the natural manufacturing process was allowed to remain





Chiefly because it was content with inefficient production methods, the old, natural indigo industry of India, as represented by the primitive factory above, was superseded by highly efficient synthetic production as it takes place in the modern indigo plant of the Dow Chemical Co.. shown at the right

inefficient, because it always had been. Indigo is by no means a complex compound and several methods for its economical production were developed shortly after the right path had been blazed, so that conquest of the field was almost too easy. Even so, post-mortem survey shows that if as much money had been invested in a truly scientific development of the natural indigo industry as was used in developing a synthetic manufacturing method, the natural material would still be an active source if not a strong competitor.

Destructive Distillation a Poor Process

For methanol, on the other hand, the fault does not so much lie with the wood distillers. From its very nature, destructive distillation must be always a poor chemical method for obtaining a compound, since it consists of tearing a complex molecule into smaller fragments, some of which in this case happen to be methanol. As well expect to obtain a maximum crop of farm products by dropping seeds at random on untreated and uncared-for land. Contrast this with the treatment of the correct mixture of gases at carefully determined and accurately controlled temperatures and pressures in the presence of the appropriate catalyst. Here, again, there is the competition between the efficient and the inefficient manufacturing method with the inevitable result. Since 1925, when it first apppeared on the market, synthetic methanol has steadily displaced the purified methanol coming from the destructive distillation of hardwood.

As an intermediate case there is the nitrate situation. Since the necessities of war made the Haber process for ammonia and the accompanying Ostwald process for nitric acid commercial successes, it has been customary to consider the Chilean industry to be on its last legs. Doubt as to this is perhaps not out of order.

Assuredly the natural monopoly is dead. But if the present method of picking nitrates out of the ground is unable to compete with pulling them out of the air, science and engineering ought to be able to put it on its feet again. One hears of a Guggenheim process designed to do just this. Funeral flowers are not yet in order.

The nitrogen fixation processes have their disadvantages. The cyanamid process is cumbersome and gives rise to large quantities of undesirable waste products. The Haber process is extremely complicated, expensive to maintain, and in many ways potentially dangerous. Both seem, however, to have a high degree of efficiency.

And how about the presently-to-be-successful methods of obtaining such chemical products as rubber, gasoline, ethyl alcohol, acetone, and butanol?

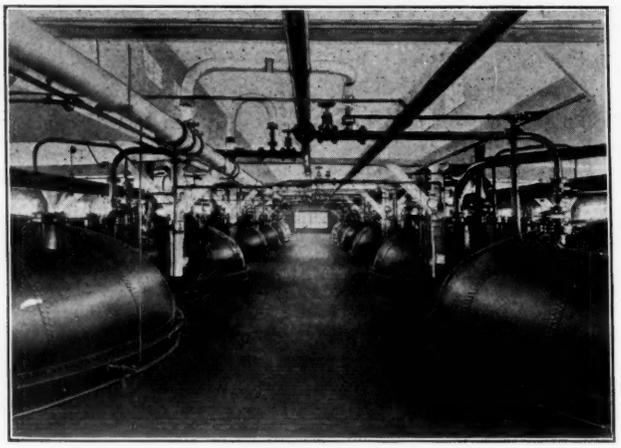
Synthetic rubber is not in any sense solved, nor is the solution very clearly in sight. Conditions are in a way parallel to those in the old indigo industry with a modern twist. Here is a substance obtained in small quantities from each tree and then worked up to give the finished product. The difference lies in the modern scene, in which good science and engineering are applied to this working and make it very good indeed. Furthermore, due attention is paid to keeping the product uniform. Nor is cultivation wholly random.

Natural Rubber Seems Safe

As to the compound itself, as distinct from indigo, rubber is a most unholy job, involving as it does, some of the farthest reaches of organic and colloid chemistry. To date, no laboratory product has been an entirely satisfactory duplication of that from latex, either in properties or costs, the really valuable accomplishment having been in keeping the price of natural rubber within bounds. At the moment it seems that if the present source is in danger at all it is not so much from a laboratory or chemical plant product as from rubber obtained from some other natural source of latex which may be scientifically cultivated and so treated as to be of maximum efficiency.

In other words, as long as plantation owners keep up with the scientific march and conduct their business on the lines dictated by the principles of scientific management, they are not likely to be pushed under.

Again, when the Bergius process was new, it was



Upper level of the fermentation tanks in the Terre Haute plant of Commercial Solvents Corporation.

to be a serious threat to the petroleum industry with its production of petroleum from coal. Now it has found its true level—a remarkably fine chemical process using petroleum as a raw material and, where petroleum is scarce, able to provide fuels and oil products from coal at a not forbiddingly high cost.

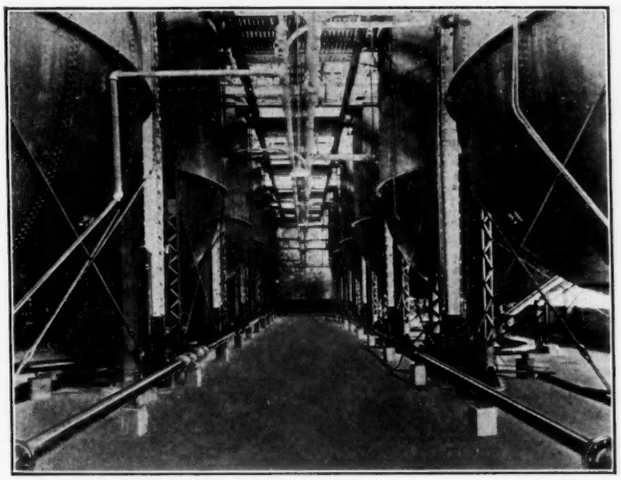
Whatever its sins the petroleum industry has developed highly efficient engineering methods for getting and using its petroleum as such. As implied, when the Bergius hydrogenation process is used to obtain this raw material from coal, it is unsuccessful in an open market. And while natural production equals (if not exceeds) demand, conditions ought not greatly to change in this respect.

The position of the major fermentation industries is also apparently quite strong.

Ethyl alcohol, as the layman to-day very well knows, is made by the fermentation, with yeasts, of carbohydrate materials. The preferred raw material is now blackstrap molasses, but practically every other fermentable substance has been used. Here is an instance of an old, yet not doddering industry. Much good science has been profitably put into alcohol manufacture, resulting in almost perfectly trained "bugs," clear-cut and extremely efficient distillations, and a very fine utilization of waste materials.

Drawbacks of Synthetic Alcohol Process

Opposed to this is a process of absorbing ethylene, from natural gas, in sulfuric acid and hydrolyzing the ethylsulfuric acid resulting. Probable drawbacks in the method are carbonization of the gases, with resulting loss of acid, and the necessity for gas separation and acid concentration plants. The process is an old one and has been tried before in Europe. Competition is with a powerful and efficient industry. Even an unwise tariff on blackstrap to force the use of domestic grain will encourage the development of new fermentable raw materials (such as the hydrolysis of wood to sugar mixtures) at least as much as it will synthetic alcohol.



Lower level of the "bug" room. Each fermenter has a capacity of 50,000 gallons.

Finally, there is to be considered the prospects for the displacement of fermentation acetone and butanol by the same products from propylene and ethylene respectively.

Here, again, the natural process is a very efficient one. Bacteria are carefully watched to keep them acting right, engineering details are well taken care of, and waste products are made to produce valuable substances. Almost as good, from an industrial point of view, is the fact that three products, all in constant demand, are produced in the single process. Consequently, competitive pressure on one of them may be distributed so that the other two assist in bearing the burden.

The new acetone process carries a threat, undoubtedly, but the question is whether the threat is to the process or merely to unreasonably high prices. If, as rumored, propylene is converted to isopropyl alcohol which is then oxidized to acetone, it is odd that large producers of the alcohol have not put acetone upon the market before this. A process for obtaining a chemical product at a cost somewhat less than the market price of the product, so that it can be used profitably in other manufacturing by the same company, and the surplus marketed, is not necessarily better than the older method. The battle ought to be interesting to watch, with odds on the bacteria.

Synthetic butanol, in the form of imported butyl acetate, began competition with the natural about two years ago and has become steadily more important. In the event of a prohibitive duty, there is a good chance that a similar process will be used in this country. The raw material is calcium carbide (fundamental cost therefore being power) which, in the form of acetylene, is converted to acetaldehyde, aldol, crotonaldehyde, and butanol. Here too, is competition between a very efficient "natural" process and a four-step chemical method, two of whose steps, dehydration and hydrogenation, are subject to side reactions causing loss. Again, an apparent balance in favor of the present method from corn.

Chemistry—The Consumer's Friend

Chemistry and applied science in general are unfailingly the friends of the consumer. Where the producer applies them and the allied engineering arts to his operations, he too is greatly benefited. Only where ill-advised economy of research is practised, other factors being equal, ought an industry closely connected with chemical products suffer from new and revolutionary methods. The contest is not between synthetic and natural methods of production, but between efficiency and inefficiency in operation or in process.

Canada is not only self-sufficient in sulfuric acid production but exports around 20,000 tons annually, all to the United States. Experimental and investigational work, directed toward augmenting the output of this acid by utilizing smelter fumes on a large scale, is in progress. The domestic consumption of sulfuric acid between 1923-1927 has ranged from a minimum of 64,000 to a maximum of 81,000 tons, says the Department of Commerce. Data covering these phases of the sulfuric acid industry during recent years are as follows:

Year	*Production Short tons*	*Imports Short tons*	*Exports Short tons*	*Apparent Consumption Short tons*
1923	87,150	281	12,203	75,228
1924	71,990	46	7,678	64,358
1925	83,396	51	19,179	64,268
1926	108,229	53	28,136	80,146
1927	98,470	52	17,407	81,115

I. G. Farbenindustrie makes first shipment of phosphate rock to Germany from German South West African phosphate deposits which it has acquired and is exploiting.

Creosote and pitch manufacturers in England are negotiating for the formation of a centralized selling organization.

Chemical Chronology 1929

JANUARY

Farm relief dominates chemical tariff hearings before Ways and Means Committee of the House. ¶ American Cyanamid Co. purchases Calco Chemical Co. ¶ Rossville Commercial Alcohol Corp. formed, merging Rossville Co., Orange Grove Refining, Federal Products, Seaboard Chemical and Industrial Chemical Manufacturing Co. ¶ Consolidated Feldspar Corp. formed by $8,000,000 merger of feldspar interests. ¶ Du Pont acquires Du Pont Rayon and Du Pont Cellophane as wholly owned subsidiaries. ¶ First shipment of synthetic nitrate of soda is made from Atmospheric Nitrogen Corp.'s Hopewell plant, the first to be produced in the United States. ¶ Franklin H. Kalbfleisch dies January 30th.

FEBRUARY

Federal Phosphorus Co. announces commercial production of diphenyl. ¶ Government suit against Franco-German potash producers settled by consent decree. ¶ Harshaw Chemical Co. formed as result of Harshaw-Fuller & Goodwin reorganization. ¶ Pennsylvania Sugar Co. acquires Franco-American Chemical Works, solvent makers. ¶ Dr. Carl Bosch and other I. G. representatives set sail for America midst rumors of an American holding company. ¶ Dr. Herbert H. Dow honored at dinner of Chemists' Club, New York. ¶ Hooker opens new Tacoma, Washington, plant. ¶ Monsanto declares 10 per cent stock dividend. ¶ United Chemicals formed to acquire 51 per cent of Westvaco stock. ¶ Du Pont places new common on $4 annual basis. ¶ Mathieson declares three hundred per cent stock dividend and increases common to 1,000,000 shares from 200,000. ¶ American Commercial Alcohol nets $6.96 per share for eight months in first report. ¶ Du Pont constructs first nitric acid tank car in the United States.

MARCH

Dr. Bosch and other I. G. representatives arrive in the United States. ¶ Wood distillers form Wood Chemical Institute, Inc. ¶ Carbide & Carbon Chemicals Corp. enters acetone field with synthetic production. ¶ Consolidated Chemical Industries, Inc., forms South American subsidiary. ¶ Kalbfleisch Corp. celebrates one hundredth anniversary and purchases John C. Wiarda & Co. ¶ Shell Chemical Co. is incorporated with capitalization of $2,000,000. ¶ Anglo-Chilean Consolidated Nitrate Corp. joins Chilean Nitrate Producers' Association. ¶ American Cyanamid begins recapitalization for expansion. ¶ Martin F. Quinn, pioneer wood distiller, dies March 30th.

APRIL

American I. G. Chemical Corp. formed with $60,000,000 assets. Debenture issue of $30,000,000 oversubscribed. Teagle, Mitchell and Ford on board of directors. ¶ Copper sulfate reaches new high of $7 per 100 pounds. ¶ Symposium on "Economic Relations Between Chemistry and Farming," features seventy-seventh meeting of American Chemical Society. ¶ American Cyanamid announces plans for $3,000,000 phosphoric acid plant near Tampa, Fla. ¶ Anglo-Chilean and Lautaro Nitrate merge interests. ¶ Swiss dye makers join German and French in European cartel. ¶ Union Carbide splits common 3 for 1; American Commercial Alcohol 2 for 1. ¶ Du Pont acquires Krebs Pigment & Chemical Co.

MAY

Sixth Chemical Industries Banquet, sponsored by Salesmens' Association, features week of Chemical Exposition in New York. ¶ Hawley bill embodying tariff revision, passes the House and goes to Senate Finance Committee. ¶ Another alcohol merger results in the General Industrial Alcohol Corp. ¶ Du Pont declares extra of 50 cents on common. ¶ Mathieson places new common on $2 annual basis; Union Carbide on $2.60 basis; American Commercial Alcohol on $1.60 basis. ¶ Calco purchases Crown Chemical Co. ¶ John W. Kellerman, treasurer, Isaac Winkler & Bro. Co. dies May 29th.

JUNE

Month of many mergers—American Cyanamid-Kalbfleisch; Monsanto-Rubber Service-Elko; U. S. Industrial Alcohol-Kentucky Alcohol; Newport-Rodia; Calco-Textile-King. ¶ Manufacturing Chemists and Synthetic Organic associations hold first joint convention. ¶ Solvents Institute is incorporated. ¶ Commercial Solvents completes construction of butyl acetate plant at Peoria, Ill. ¶ International agreement is reached between producers of natural and synthetic nitrate. ¶ Lautaro Nitrate Corp. floats $32,000,000 bond issue, largest of the year. ¶ New plants planned: Stauffer Chemical, $1,000,000 sulfuric acid, Hammond, Ind.; American Cyanamid, $35,000,000 power, Holston River, Tenn., Tennessee Eastman, $2,000,000 cellulose, Kingsport.

JULY

Jacob Publicker dies July 7th. ¶ Du Pont secures complete control of Lazote, which thereby becomes Du Pont Ammonia Corp. and announces its entrance

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General Chemical Company
Goodyear Tire & Rubber Co.
Heller & Merz Co.
Maxwell House Products Co.
National Adhesives Corp.
National Aniline & Chemical Co., Inc.
National Carbon Company
Parke, Davis & Company
Pure Oil Company
Standard Oil Co. of New York
The Carborundum Co.
The General Foods Company
The Roessler & Hasslacher Chemical Co.
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Carpenter Drums conform to I. C. C. regulations. They are widely used for such products as—chemicals, abrasives, dyes, soap powders, insecticides, coffee, cocoa, spices, foods, drugs, greases, plastic materials.
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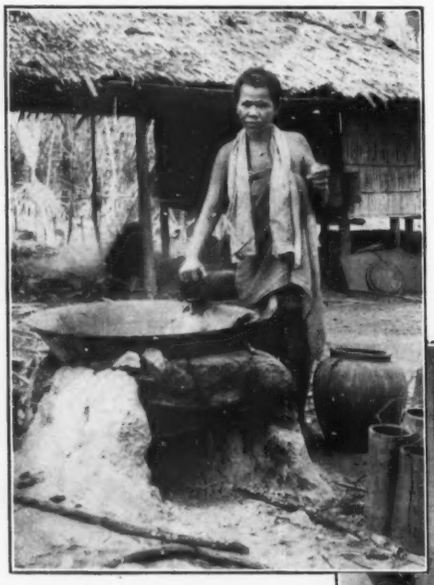
CHEMICAL

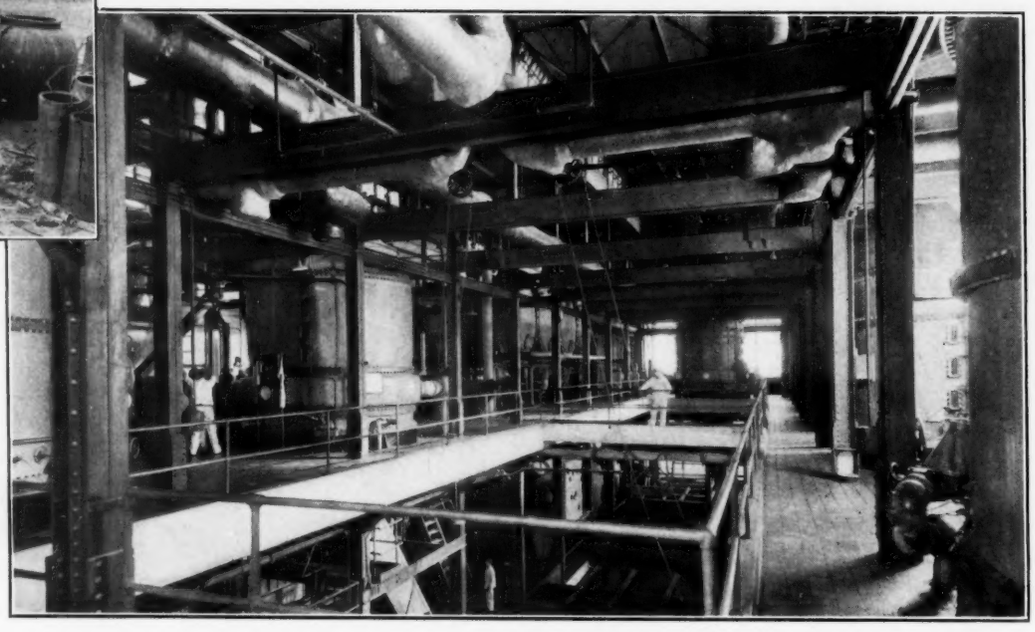
Photographic Record

Where the benzol comes from. Interior of the benzol building at the Clairton By-Product Coke plant of the Carnegie Steel Company.—Ewing Galloway

Chemical engineers meet in Asheville. American Institute of Chemical Engineers holds annual convention in the Grove Park Inn, Asheville, N. C., December 2 to 4. Officers elected at that time were: president, Alfred H. White; vice-president, J. C. Olsen; treasurer, M. H. Ittner; secretary, H.C. Parmalee; and auditor, David Wesson



In the depths of equatorial Africa sugar refining may not be a chemical industry, but in Baltimore! — native woman extracting sugar from native palm contrasts vividly with modern engineering equipment in the plant of the American Sugar Refining Company



NEWS REEL

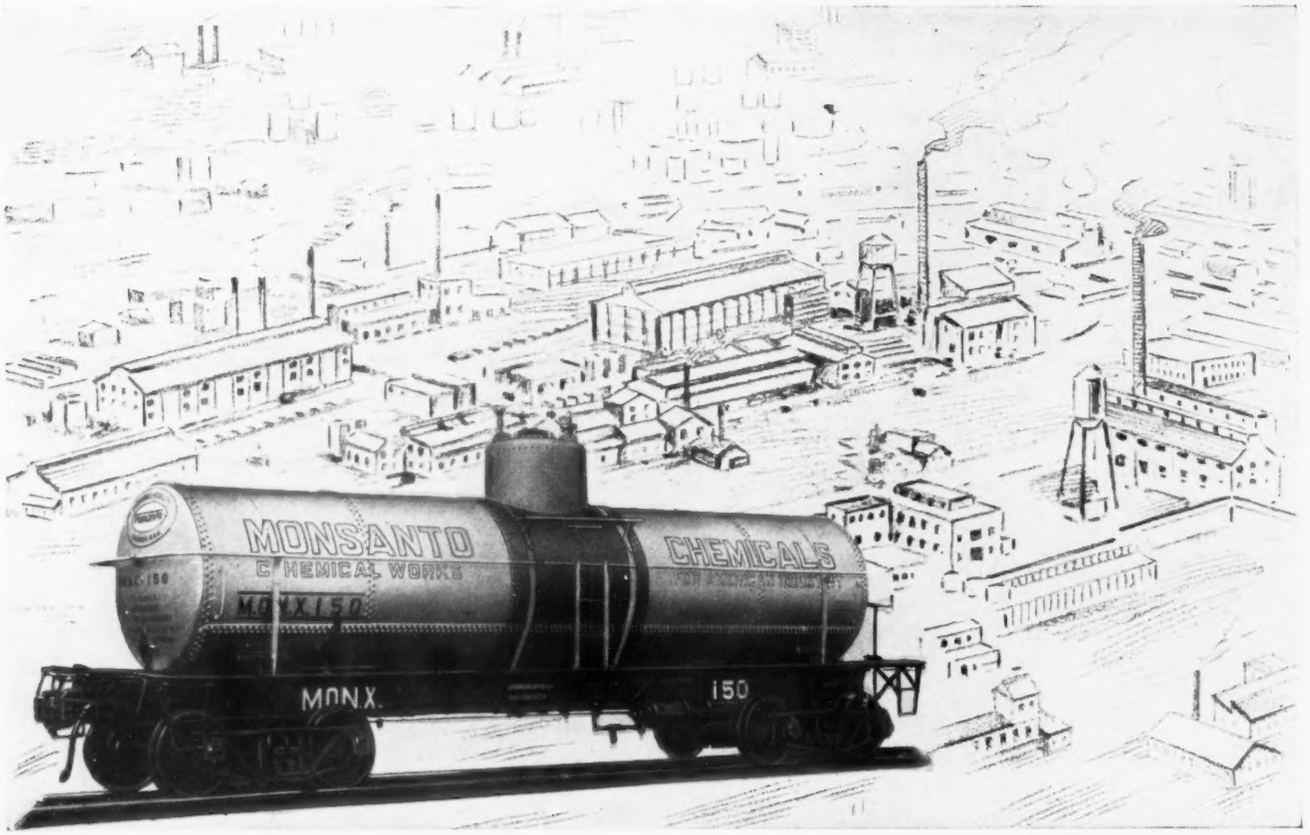
of Chemical Activities

It's a far cry from the dingy days of Platt street to the "Roaring Forties"—two views in the new offices of Monsanto Chemical Company in New York, the general offices at the left, and above, John W. Boyer, vice-president in charge of sales, seated in his private office

Calcium chloride takes on another highway job. What with dust in summer and snow in winter, this chemical is proving its versatility at whatever season of the year. Brooklyn, N. Y. turns to chemical methods of snow removal as a modern solution to its street cleaning problem after an early December snowfall.—P. & A. Photos

He thought it was about time they remembered they were United States Senators. Edwin M. Allen, president, Mathieson Alkali Works, who, at President Hoover's economic conference bearded the Senators in their dens and was appointed representative of the chemical industry on the General Economic Executive Committee

Supplying Basic Industries With Acids and Intermediates



MONSANTO offers industry uniform, high quality products, made on a large scale by the most modern methods. Shipments move promptly in tank cars or L C L over 28 trunk line railroads, or by water freight (often by both rail and water) to all parts of the country. A central geographic location saves freight costs and shortens the time in transit.

Write for a complete list of Monsanto Industrial chemicals with quotations on specific quantities.

Address your orders and inquiries to us at St. Louis, Mo.

A few of the industrial chemicals made at the Monsanto plant in Monsanto, St. Clair County, Illinois, include:

CAUSTIC SODA
CHLORINE
SULPHURIC ACID
CHLORSULPHONIC ACID
NITRATING ACID
MURIATIC ACID
NITRIC ACID
MIXED ACID
ORTHONITROCHLORBENZENE
ORTHOCHLORANILINE
ORTHONITRANILINE
PARANITRANILINE
PHTHALIC ANHYDRIDE
ZINC CHLORIDE
SALT CAKE
SODIUM SULPHATE
NITRE CAKE
ELECTROLYTE (BATTERY ACID)

Monsanto Chemical Works
St. Louis, U.S.A.
NEW YORK - CHICAGO - SAN FRANCISCO - LONDON

CHEMICALS of QUALITY
Monsanto
St. Louis, U.S.A.

into the production of synthetic methanol. ¶ Standard Oil and I. G. reach co-operative working agreement. ¶ American Cyanamid acquires Selden Co. and Calco buys May Chemical. ¶ Union Solvents is incorporated with $1,000,000 paid in capital. ¶ Midwest Carbide is organized by Shawinigan and National Lead ¶ Dow declares four hundred per cent stock dividend in 4 for 1 split. ¶ Monsanto splits common 2 for 1. ¶ American Solvents increases capital for expansion.

AUGUST

Burnell R. Tunison dies August 8th. ¶ Chemical representatives of Commerce Department hold conference in Paris. ¶ Union Carbide & Carbon annouces plans to open plant in Buffalo for manufacture of methanol. ¶ Senate Finance Committee reports tariff bill with downward revision from Hawley bill but higher than Act of 1922. ¶ Harold H. Hall, retires from active business August 1, after 41 years with Arnold, Hoffman. ¶ American Commercial Alcohol acquires Kessler Chemical. ¶ Ansbacher-Siegel Corp. formed in dry color merger. ¶ Solvay Investment Corp. makes $25,000,000 stock offering with purchase warrants for Allied Chemical stock at $325.

SEPTEMBER

Du Pont Ammonia appropriates $3,500,000 for expansion of Belle, Va., plant. ¶ Commercial Solvents acquires Commercial Pigments. ¶ Davison Chemical plans construction of $1,000,000 plant at Houston, Tex. ¶ Shell Chemical Co. begins construction of $5,000,000 nitrogen-fixation plant on Pacific Coast. ¶ Robert Collyer Ingalls dies September 11th ¶ National Ammonia, Du Pont subsidiary, acquires Pacific Ammonia & Chemical Co., largest anhyd ous ammonia maker on Pacific Coast. ¶ Horace Bowker is elected president, American Agricultural Chemical. ¶ James A. Rafferty is elected president, Carbide & Carbon. ¶ Edmund G. Robinson is appointed head of dyestuffs department, E. I. du Pont de Nemours & Co. ¶ Leland I. Doan is appointed sales manager for Dow succeeding Lee Camp who retires, but continues with firm in a consulting capacity. ¶ Lautaro Nitrate increases capital to $14,500,000 for expansion program. ¶ Franklin P. Summers leaves Noil to go with Calco. ¶ American Cyanamid offers new stock.

OCTOBER

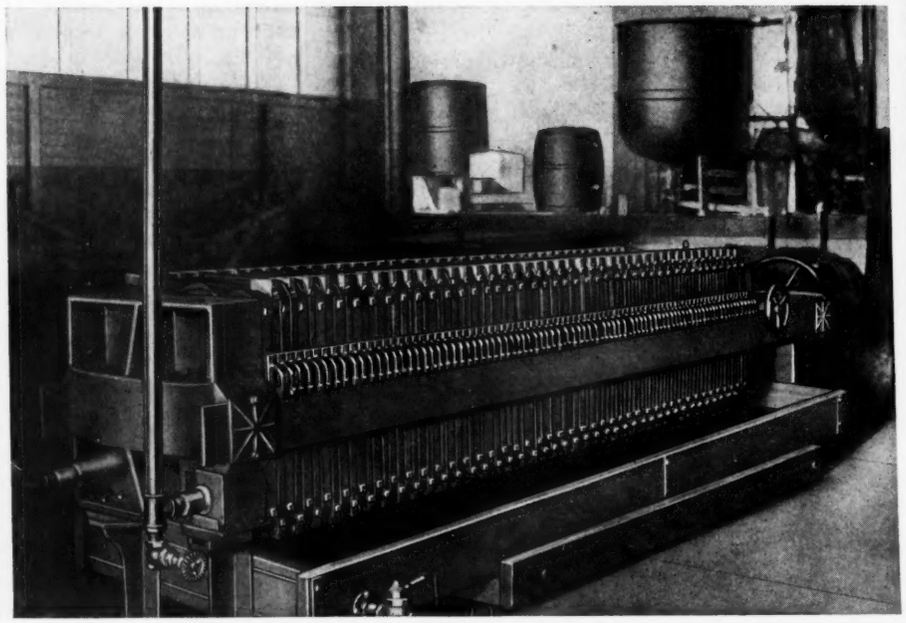
Deaths: William H Barnard, treasurer, International Salt, October 5th; Henrik J. Krebs, chairman of the Board, Krebs Pigment & Chemical Co., October 7th; Dr. Edward E. Slosson, director of Science Service, October 15th. ¶ Monsanto acquires Merrimac and fine chemical division of Mathieson Alkali. ¶ M. E. Clark retires as president, Welch, Holme & Clark Co. ¶ C. Olin North resigns from Rubber Service Laboratories. ¶ American Cyanamid acquires American Powder Co., solvent maker. ¶ Palestine Potash, Ltd., formed in London to exploit Dead Sea chemicals. ¶ Chlorine contract price reduced to 2¾ cents per pound. ¶ Chemical stocks with others, go to new lows in stock market decline; Allied Chemical 197; Commercial Solvents, 20⅛; Du Pont 80; Mathieson, 29; Monsanto, 47; Union Carbide, 59; U. S. I. 95.

NOVEMBER

Standard-I. G. Co. formed to merge hydrogenation patent interest of Standard Oil of N. J. and the German I. G. ¶ Newport Co. acquires control of Acetol Products. ¶ Du Pont Ammonia Corp. announces plans to triple methanol capacity and double ammonia capacity. ¶ Rayon and Synthetic Yarn Association formed by fourteen rayon producers. ¶ American Celanese only conspicuous absentee. ¶ National Fertilizer Association discusses $1,000,000 Plantfood Institute. ¶ Chemical Division, Bureau of Foreign & Domestic Commerce, inaugurates first of series of "Chemical Days" in New York. ¶ Belle Chemical Co. announces plans for production of synthetic camphor. ¶ Du Pont declares extra of 70 cents on common. ¶ Allied Chemical declares 5 per cent stock dividend. ¶ Du Pont announces plans for $25,000,000 building projects.

DECEMBER

Carbon Black Export Association, Inc., formed by representatives of six American producers, controlling more than 92 per cent of the world's carbon black. ¶ Tariff revision and the re-election of August Merz as president, occupy the Synthetic Organic Chemical Manufacturers' Association at its annual meeting. ¶ Monsanto Chemical Works, through Graesser-Monsanto, acquires Sunderland Tar Distilling Works of Brotherton & Co., Durham, England. ¶ "American Dyestuff Reporter," "Plastics" and "Chemical Markets" join in joint publication of series of Buyers' Guide-Books. ¶ Charles B. Hall, Manager Chemical Dept., Cleveland Cliffs Co., dies Dec. 22.



A Shriver Filter Press in the plant of the Red Wing Company, Fredonia, N. Y.

SHRIVER FILTER PRESSES FILTER FOODSTUFF

In the preparation and manufacture of foods Shriver Filter Presses are used by the leading food companies to secure that clarity and sparkling appearance so essential, particularly in foods packed in glass. Manufacturers of foodstuffs desirous of improving the quality and appearance of their products will find in Shriver Filter Presses a means for efficiently and economically attaining these ends.

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FILTER PRESSES FILTER CLOTH DIAPHRAGM PUMPS

WOODEN EQUIPMENT---

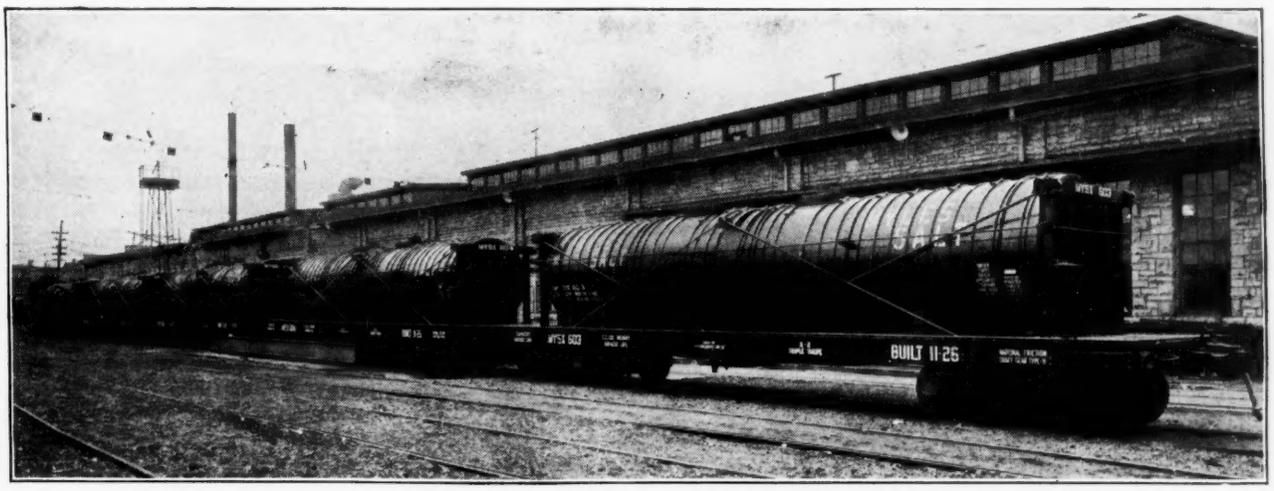
In Making, Storing and Transporting Chemicals

By Theodore M. Knappen
National Lumber Manufacturers' Association

IN the chemical industry wood tanks and vats are used for two primary purposes; namely, storage and process work. In the storage field they are used both for water and acids and it is quite surprising to know that more water is employed in the process industries than in all other industries combined. Water is the most universal chemical solvent known and finds extensive application for dissolving and crystallizing as well as washing, precipitation, classifying materials, and for other purposes. In many manufacturing processes water is one of the most important raw materials such as, for example, in the manufacture of artificial gas used for fuel and illuminating purposes. The largest proportion of this gas is made by the action of steam on coke. Other important examples are the manufacture of acetylene, hydrogen and oxygen, all of which are made in large quantities and use much water. Flotation for concentrating ores is also a process requiring large quantities of water and extensive piping systems.

For handling water in such large amounts wood tanks have been found both economical and effective. Their lightness permits of ready rearrangement, and the component parts, being light and easily handled can be assembled in restricted spaces and without mechanical equipment. Repairs can be made by plant labor promptly when needed, and piping is most conveniently installed or changed.

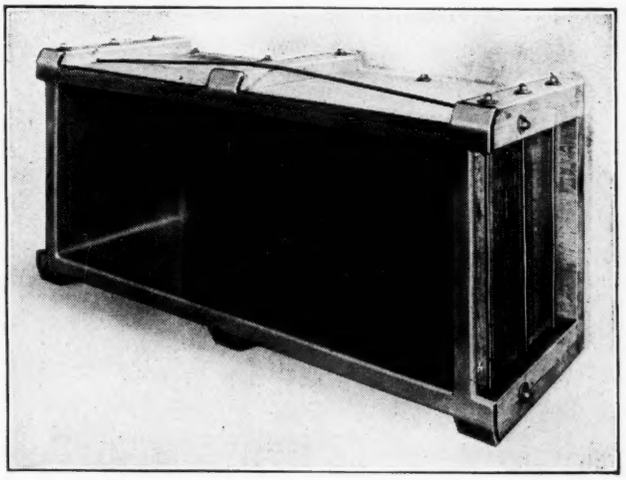
Handling the raw water for processes such as just mentioned is only a small part of the wood tank's function. In the sugar industry, for instance, when the sugar is crystallized in vacuum pans, the steam given off must be condensed by circulating water and then the condensate must be pumped to a storage



Wooden tanks, lined with rubber, used in the transportation of hydrochloric and phosphoric acids.

tank to go through the process again. A medium-sized sugar refinery uses as much water as a town of twenty-five thousand population and about twenty-five different wood tanks for storage and handling.

Wood storage tanks for acids are used extensively in many industries, those stored satisfactorily in unprotected wood tanks being acetic acid, citric acid, organic acids and weak solutions of mineral acids such as hydrochloric, nitric and sulfuric. For concentrated mineral acids, wood tanks lined with lead or rubber are frequently used, and this type of installation appears to be rapidly increasing. Where acids are shipped in tank cars, large storage tanks are required for handling them at destination and these are usually of wood. Many plants make their own acids and in these cases storage tanks are needed of large capacity. An important application of wood tanks is in the storage of used acid, as most manufacturers arrange to use it over and over again if possible. There are also large quantities of waste acid which cannot be thrown away due to laws preventing stream pollution. This waste acid must be neutralized or partly neutralized before it can be disposed of. Since the material is not affected by the chemical reactions which take place, wood tanks always offer a most efficient means of storing such acid and treating it before it can be thrown away. Wood tanks for storing



The use of highly concentrated acids makes it desirable in many instances to use a lead lining in the wood tank. This combination gives a very long life

acids are sometimes treated with pitch or other protective coatings where the acid is strong enough seriously to attack the wood.

Paraffin impregnated wood tanks are also used to quite an extent by certain industries for storing acids, fruit juices, and extracts. In general they have given satisfaction and the tendency is for their expansion in food products industries.

While water is used in larger quantities than other liquids, chemical process industries handle more miscellaneous liquids and larger quantities of them than all other industries combined. Wood tanks offer distinct advantages for storing these liquids where temperature changes are important, since the flow of heat through the tank walls is much slower than with other materials used for the purpose. Many refineries use both wood and other materials for tanks for storing crude oil, lubricating oil, gasoline and other finished products. These tanks are usually exposed to sunlight and these other materials, being much better conductors of heat than wood, increase

Wood tanks with special wood covers and fittings, rubber lined, for use in storing Muriatic Acid. The wood is not affected by the acid within or the acid fumes outside

evaporation losses and the chances of contents reaching ignition temperatures. Petroleum is handled in larger quantities than any of the miscellaneous liquids but there are numerous others which require wood storage tanks. Grain alcohol, turpentine, vegetable oils, animal oils, benzene, carbon tetrachloride, acetone and numerous other liquids are stored very frequently in wood tanks. Wherever liquids are handled which are readily ignited or which give off explosive gases the wood tank has advantages in that it does not give off sparks when struck by hard objects.

Paper pulp is frequently handled in liquid or semi-liquid form and affords another good example of miscellaneous liquids which are usually handled in wood tanks. The list could be extended indefinitely including such commercial liquids as wood alcohol, ammonia, toluene, tanning extracts, glycerine, paint and varnish, etc.

Wood tanks and vats are also used extensively in treating or processing materials which are being manufactured. Some of the more important uses for wood containers in this field follow:

Pickling of steel castings, forgings, steel plate and other forms of steel, as well as wrought iron and special alloys, is often done to eliminate mill scale and prepare the material for painting or electroplating. The process of treating certain metals with chemical solutions to produce a protective coating of oxide is also referred to in some cases as pickling. Weak acid solutions of various compositions to suit the particular metal are used. Pickling is carried on almost exclusively in wood tanks and vats. For this purpose wood is superior to metal for the reason that a metal tank would cause electrolytic action between it and the metals which were being treated. Pickling is carried on very extensively in different industries which are not classed as process industries. It is practiced very generally in the automobile industry and in the manufacture of almost every kind of machinery.

In the Tubes of Chemistry

—lay new profits for two Industries!

Incidents of the constructive service one industry renders to others.

ALL INDUSTRY has its obstacles . . . limitations barring many products from new uses and new markets. Often these barriers are paper-thin, yet real enough to place inviting fields of profit just beyond reach.

Adapting a line to new markets may require only a new process—or a new ingredient—a new treatment. But to *find* that unknown quantity—that eternal 'X' of industry—someone must spend thousands of dollars in research work.

Recently that was the case in the lacquer and artificial leather industries. Both found further expansion difficult. And simply because a new and different solvent was needed to fit their products for potential users.

U. S. Industrial Alcohol chemists studied the situation—experimented—then produced an improved quality of Ethyl Acetate that enabled both industries to meet the requirements of a new and wider market.

We could cite scores of similar instances. For, opening new markets and increasing the scope of old ones is really the function of our laboratories. Literally thousands of alcohol-chemical products originate here for the benefit of American business.

Such are the resources and facilities of this company, that practically any quantity of any alcohol product can be supplied to any customer at any time. And such are production standards, that every shipment of each product is identical in quality.

Write for your free copy of our recently revised booklet, "Solvents." Many industrial firms find it exceedingly useful. Very likely you will too!

Often great industrial changes originate in these prosaic tubes of glass. They are the tools of chemistry . . . the "open sesame" to wider markets, greater profits.

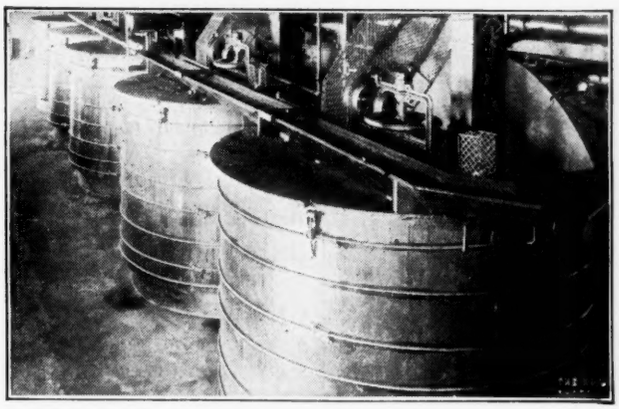
U. S. INDUSTRIAL ALCOHOL CO. **U. S. Industrial Chemical Co., Inc.**

110 East 42nd Street, New York

The use of wood for settling tanks is even more extensive than for pickling tanks. An example is in the extraction and refining of common salt. The brine is first conducted in storage tanks and next into settling tanks. In a salt refining plant at Manistee, Michigan, twelve wood settling tanks, each of a capacity of 95,000 gallons, are provided. The purpose of these tanks is to free the salt solutions from impurities. The refining of salt is one example of several hundred important commercial processes which use wood settling tanks. They are used in the refining of sugar and other crystalline substances, for recovering precipitates, and for clarifying alcohol and other solvents.

Mixing tanks are used as frequently as settling tanks. In the manufacture of beverages, drug, toilet preparations and all kinds of materials that are marketed in the form of liquids, wood mixing tanks comprise some of the most important plant equipment. The different ingredients are poured together in such tanks and usually mixed by mechanical means. Wood, being inert chemically, does not take part in the chemical reactions sometimes involved, nor does it affect the taste, color or odor of mixture.

In some cases, gases are generated by chemical reactions which take place and mixing tanks are fitted

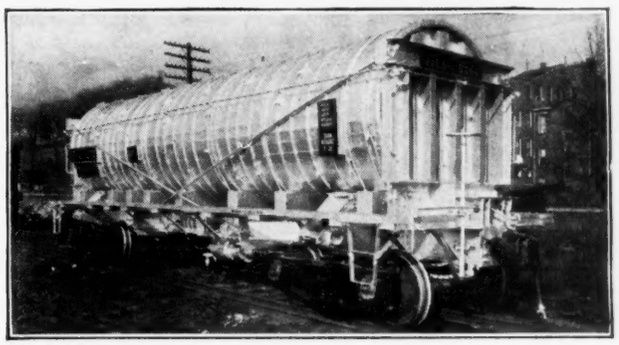


Manufacturers of highly corrosive acids are rapidly appreciating the value of rubber-lined wood tanks. The above battery of tanks, equipped with special fittings and agitating mechanism, has been in use in particularly severe service over a long period with no visible sign of deterioration.

with air tight covers, in such instances, so that the gas may be collected.

Refrigeration equipment in addition to its vast field of food preservation, is used for making liquid air and for liquefying numerous other gases. It is also used for crystallizing certain materials at low temperatures. It is used for the storage of various organic chemicals which require low temperatures to prevent deterioration. Wood brine tanks are frequently used in the medium sized and small refrigerating plants which are most popular in chemical processes. Such wood tanks have an advantage over metal tanks for handling refrigerating brine, in that wood is a much better heat insulator, and less subject to attack by the brine.

In bleaching and dyeing processes there is the question of what kind of wood should be used in making the tanks. Chlorine or almost any bleaching agent will readily attack most metals. There are certain corrosion resisting alloys which will withstand bleach-



Type of single tank car made of wood which daily traverses the railroads of this country carrying water, chemicals, food products, etc.

ing agents, but it does not pay to use them because any metal impurity on the surface of the tank or introduced with the bleaching solution will set up electrolytic action and cause discoloration. The process of dyeing all kinds of textiles is as important or more so than bleaching. Impurities in a dye bath are more objectionable than in a bleaching solution. For this reason wood tanks are used almost exclusively for dyeing except in the case of certain dye solutions which are known to have no effect on metals. The manufacture of dyes as well as their application employs wood tanks on a tremendous scale. Uniformity of product and prevention of discoloration are extremely important and can be assured only by eliminating contact with metals.

Fermentation is not practiced so extensively at present as it was before national prohibition laws went into effect but the legitimate demands for industrial alcohol are increasing all the time and fermentation is a very common process. It is usually divided into two stages, each of which requires a separate series of wood tanks. The first stage consists of changing starch to sugar with the aid of malt under the proper conditions. This conversion requires several days time and after it is complete the mixture is transferred to other wood tanks where the sugar is converted into alcohol. This latter process also requires several days time so that very large tank capacity is required. Uniform temperatures are essential to successful fermentation, and are most easily secured with wood tanks and vats through which heat does not easily escape.

Wood filter tanks are used very extensively for both atmospheric and vacuum filtration. For this purpose tanks are fitted with perforated bottoms and are usually partly filled with gravel and sand or other suitable filtering medium. For vacuum filtration the tank has a lower chamber, both the upper and lower chambers being made of the same material. Wood

tanks are frequently used for this purpose and since filtration is one of the most common processes in industry, it employs wood tanks extensively.

Where galvanizing is accomplished by applying molten zinc to other metals wood tanks are of course unsuitable, but there are other galvanizing processes carried on at low temperatures and involving the use of wood tanks. However, even in the galvanizing plants, wood tanks are required for cleaning the metals preparatory to their galvanizing. The application for galvanizing tanks, however, is small compared to that for electroplating tanks. The advantages of wood in this case for avoiding stray electrolytic effects are as evident as for bleaching and dyeing. All kinds of silver tableware and silver ornamental products, as well as numerous nickel plated and copper plated products are prepared by the electroplating processes. Suitable wood tanks are necessary in order to prevent interference in the electroplating process by another metal.

The inherent properties of wood make it a most desirable raw material to use in the tank and vat industry, as it has the necessary qualities of light weight, strength, economy, durability, nonpermeability, low heat conductivity, acid resistance, workability with tools, and universal availability. No other natural material so well combines all these essential properties.

Strength

Wood has proven that in suitable thicknesses it is amply strong for all structural requirements of the tanks and vat industry, no cases having been reported of mechanical failure of a well-designed tank or vat.

Probably the most severe use given wood vats is by the steel mills, where large steel plates, in some instances weighing several tons, are lowered into the wood tanks for a bath of sulfuric or muriatic acid. Vats of this character are usually made of timbers 12″ x 12″ and even larger, and as long as 100 feet. Such tanks give excellent service, and it is reported cannot be satisfactorily built of steel, concrete, or other materials on account of the strong acids used and the severe abrasive treatment given the tank in the handling of the heavy plates.

Durability

The durability of some of the common commercial woods in exposed situations is remarkable and is probably due to the fact that wood saturated with water decays very slowly if at all. There are many instances of wood water tanks which have given service for half a century with very little cost for repairs. In this connection it is interesting to note the record of railroad water tanks used by a number of different railroads, which have shown an average life of about thirty years, with a number still remaining in service. It is probable that before all these tanks are replaced the average life will approximate forty years each.

While wood is sufficiently porous to permit evaporation, it is practically nonpermeable to most liquids at ordinary temperatures, and this is another of its many desirable qualities not possessed by certain other raw or manufactured materials of which tanks and vats are made. This tendency to permit evaporation makes it undesirable in most instances to paint the outside of wood water tanks unless it be with a porous paint, since any sealing up of the outside has a tendency to hold moisture in a stagnant condition in the wood, and thus produces a condition which permits decay. The general rule, therefore, where it is desirable to paint wood tanks for the sake of appearance, is to use an extremely porous paint.

Low Heat Conductivity

Another strong point in wood's favor is its low heat conductivity. This is especially desirable in water tanks in the northern climates where the water must be heated in the winter time to prevent freezing. Much less heat is required for wood tanks than for those made of steel. On the average the steel tanks require about three times as much heat as do those of wood to prevent the water from freezing. In large storage tanks the additional coal required to heat steel tanks represents a very appreciable item of maintenance cost.

Wood's ability to resist heat conduction is another important consideration dictating its use in industry. Temperatures are important in almost all manufacturing processes and where metal tank equipment is used, large quantities of asbestos and cork insulation are required. This fact alone should justify the use of wood tanks in many cases where metal tanks are now being used.

Acid Resistance

Wood's natural resistance to acids makes it not only a very desirable material, but practically the only generally available material that can be used for tanks, vats and other storage containers in tanneries, paper mills and various acid plants. As a matter of fact, it is practically the only material thus far found in commercial quantities, and of reasonable economy, that satisfactorily serves such exacting purposes.

In some instances where highly concentrated acids are employed, it has been found desirable, in order to secure the maximum life of a wood tank, to line it with certain substances such as lead or rubber which have the ability to resist the attacks of the concentrated solutions. In such cases wood tanks are more desirable than steel since they are not affected on the outside by the fumes of the acids.

Low Maintenance Cost

The economy of using wood tanks does not end with the first cost. The greatest saving comes in the matter of upkeep. Wood water tanks generally require practically no maintenance except in cases

where, for appearance sake, it is desirable to paint them. Painting is required only on the outside every six to ten years. On the other hand, if steel tanks are to give anywhere near the service life which wood affords, they should be painted both on the inside and on the outside at least every three to five years. In order to paint them on the inside it is necessary that the tanks be drained, thoroughly dried out and scraped. This not only increases the cost of maintenance materially, but has the further disadvantage of putting the water supply out of commission for a period of from ten days to two weeks, thus increasing the fire hazard. There is also, in addition to the cost of labor and paint, the cost of refilling the tank, which is considerable in a tank of 50,000 gallons capacity.

Wood tanks, unlike those of other materials, are quickly and easily repaired. Steel tanks, on the other hand, require expensive tools, skilled labor, and usually a relatively high cost for repair. The maintenance cost of a tank cannot always be calculated in the actual cost of painting and making repairs. This cost is often multiplied several times by loss due to forced shutdowns, causing loss of production and loss of profitable business. It is easily apparent, therefore, why the wood tank is the more economical. Painting, labor and repair expense is much less, and the equipment is practically always in service.

Insulation

There is no question but that wood tanks lead the field when it comes to heat insulation. The natural structure of the wood itself makes it a poor heat conductor and, in the thickness used, it is far superior to steel or concrete in this respect. For example, heat is lost through a quarter inch of steel more than nine times as fast and through six inches of concrete two and one-half times as fast as through two inches of lumber. This is a very important factor in water tanks which must be heated in the colder climates, or in industrial tanks which must maintain uniform high temperatures.

Industrial Importance

Wood tanks are used in nearly every industry for one purpose or another. They have proved, through long years of service, to be the longest lived and most reliable of any type of tank. Reliability is a factor of great importance in industrial equipment. Wood tanks, being easy to keep in condition, eliminate the costly shut-downs and loss of fire protection incident to the frequent painting and repairs necessary for the safe maintenance of steel tanks, besides materially reducing the cost of painting, the water lost through emptying the tank, and expensive repairs.

Swenson Evaporator Co., Harvey, Ill., issues new bulletin entitled "Application of the Forced Circulation Evaporator. Copies are available on request.

Revolvator Co., Jersey City, issues new bulletin entitled, "How to Pile Bales." Copies are available upon request.

New Plant Construction

Anglo-Chilean Corp. completed its Maria Elena nitrate plant, located inland from the Port of Tocopila, Chile, and will get capacity production of 500,000 tons of nitrate of soda annually early in 1930. The Guggenheim process, controlled by the Company, enables it to produce nitrate of soda at from 50 to 60 per cent of production costs of other companies operating in Chile, which use the Shanks process of recovery.

Sherwin-Williams Co. announces a $1,500,000 expansion program including $450,000 for a linseed oil plant, a printing, advertising and publicity plant and an iron oxide plant in Cleveland; a lithophone plant and other construction at Coffeyville, Kan., to cost $300,000, and a $520,000 expenditure at Chicago for new plants and warehouses.

Roessler & Hasslacher Chemical Co. plans construction of two one-story additions to Niagara Falls plant to cost about $40,000 with equipment and also a small addition to Perth Amboy plant.

Smith Agricultural Chemical Co., Columbus, Ohio, files plans for one-story plant addition to cost about $40,000 including equipment.

Monsanto Chemical Works begins construction of addition to fine chemical plant in St. Louis, to cost over $100,000 with equipment.

Sodalumina Chemical Corp. of Canada plans construction of plant at New Glasgow, N. S., to utilize large deposits of clay for the manufacture of alumina.

Canadian Industries, Ltd., purchases 1,000 acres at East Selkirk, Manitoba, upon which to erect an explosives plant involving expenditure of $750,000.

Stuebing Cowan Co., Cincinnati, completes new one-story plant in that city.

Commercial Chemical Co., Memphis, approves plans for two-story plant addition to cost $28,000 with equipment.

Berry Chemical Co., Manistique, Mich., plans to rebuild portion of plant recently destroyed by fire at cost of $60,000.

Davison Chemical Co. plans erection of two-story addition to Baltimore plant to cost about $200,000 including equipment.

Canada Gypsum & Alabastine, Ltd., plans erection of plant at East Calgary, Alberta, Canada.

United States Customs Court rules upon the classification of certain imported soap made of chlorinated castor oil and other oils. This soap, imported by the Standard Chemical Products, Inc., was subjected to duty by the New York collector of customs at the rate of 35 per cent ad valorem, under Paragraph 56, Tariff Act of 1922, as soap dutiable for use in the processes of softening, dyeing and tanning. Judge McClelland reaches the conclusion that, even though this soap was described on the invoice as "industrial soap for the textile industry", it could only be used for cleansing. Duty is fixed at only 15 per cent ad valorem under Paragraph 82.

Dyestuffs department, E. I. du Pont de Nemours & Co., Inc., announces addition to line of copper free sulfur colors, "Sulfogene Yellow GGCF".

PROTECTING—

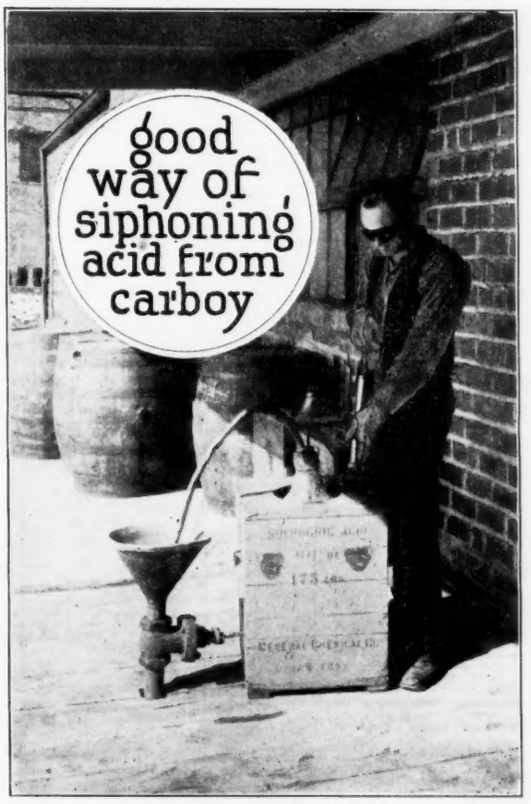
the Chemical Plant Worker

By A. L. ARMSTRONG
General Supervisor of Safety and Fire Prevention
Eastman Kodak Co.

THE greatest safety factor in the chemical, as well as other industries, is the education of the individual employee on the nature, hazards and purposes of the material which he is handling every moment of his working period. Due to the fact that every different type of operation requires a careful study, it is very difficult to say what the protective equipment should be and a great many times the method of handling can be changed, making it unnecessary for men to wear uncomfortable equipment.

The Worker's Part in Selection

In any chemical plant great care must be taken to select the proper type of protective equipment, and before the final selection is made some thought should be given to the type of equipment the men will like. This is accomplished in many different ways. In some plants a committee representing the men try out new types of protective equipment and select what they think is the most comfortable to wear. In other plants the men on this job try out different types of equipment. A great many times this procedure helps greatly in getting men to wear protective equipment of their own accord because they have had a part in the selection.



In all acid manufacturing plants comfortable goggles should be worn whenever men are working where it would be possible to get splashed, and if acid is being handled in dishes or open containers goggles should be worn at all times. The ordinary spectacles will not give protection.

Goggles selected for men on employment of this kind, in order to give absolute protection, must fit tightly enough around the eye to prevent water from being run in between the goggles and the face if blown out of wash bottle. Every man working around caustics of sufficient strength to cause injury to the eye should be supplied with goggles. These should be his own individual property, and this ought to include men in acid plants, cotton nitrating plants, silver nitrate plants, also mechanics who are making repairs or men handling carboys or drums of acid outside the departments.

Equipment For Spills

On work where a spill is liable to occur men should wear rubber gloves, hip boots, aprons, felt sleeves, as well as goggles. Men handling carboys or drums of strong acid should wear hip boots, goggles and rubber gloves because mechanical failures occur very often and men not properly equipped under these conditions may suffer severe injury.

Because of mechanical ventilation there are very few places in industries where it is necessary for men to wear masks continuously but because of mechanical failures and mistakes of the human element, proper type masks should be supplied. In acid plants these should be the man's personal property and he should have a proper place for storing which will keep any fumes or moisture from the mask which would cause deterioration and someone in authority familiar with the equipment should make frequent periodic inspection of all protective equipment.

The selection of masks must be made with great care, and in places where men wear goggles the paint spray type facepiece would probably be the better, or the old army type which goes directly into the mouth may be used. Either of these masks is much

cooler than the Kops facepiece, and for ordinary repairs or spring leaks, blow-ups, etc., these types of masks, are probably preferable. However, they should only be used for emergency work where the concentrations are low.

Importances of Shower Baths

Wherever strong caustics are handled shower baths should be installed and if it is at all possible for a man to get sprayed with acid the shower should be controlled by a platform onto which he can step.

On loading platforms where carboys or drums are handled, located where the temperature gets below freezing, showers can be installed and controlled by a special stop cock located under the ground and controlled by a lever arrangement. This stop cock allows the water to drain off after the shower has been used and prevents freezing which would render the shower useless.

When necessary to open a flange on a line having—pressure, rubber boots and gloves and goggles should be worn, and the right bolts loosened first.

In plants, such as nitric acid or sulfuric acid plants, where men are likely to get acid on their feet or other parts of the body, tubs of water should be supplied. As an illustration of the value of this, we know of a case where no salt cake would come out of a still at the end of a run. In trying to determine where this material had gone, one of the men opened the ash pit door of the furnace under the still and acid rushed out over his feet. He jumped into a tub of water within six feet of where the accident occurred and as a result received a very minor injury in the form of a blister about the size of a quarter on one side of his foot. Further investigation proved that the still had sprung a leak and the acid had run down through the fire box into the ash pit, and the door on the ash pit was sufficiently tight to keep the acid from leaking out.

Immediate Use of Water

Showers have prevented serious injuries to employees properly trained to use water immediately.

We know of a case where an employee was blowing acid from one building to another and after putting pressure on the blow tank he started to inspect the line. A new extra heavy nipple which had been installed split open, showering this man with strong acid. He immediately jumped under a shower bath, turned on the water and, keeping his eyes shut, found the bottle of weak ammonia solution which he poured over his head, after which he got back under the shower and called for help. This man was immediately taken to the hospital and the only place any reaction showed when carbonate solution was applied was in the ears and this was of no consequence, because of the dilution of the acid. This one injury and the manner in which it was taken care of by the employee himself proves beyond any doubt the value of education and proper protective equipment.

Various Ventilation Methods

In artificial leather plants and lacquer plants, mechanical ventilation can be installed which will give adequate protection. There are several different methods of ventilation, where it is necessary to handle solvents of this kind in cans. However, the best type, I believe, is a pipe which comes down and covers practically the entire area of the can; where the rubber is being put into benzol for dissolving, a ventilating system of this kind will draw the air in past the man and over the top of the can, preventing him from getting any of the fumes.

In most lacquer plants the entire question of protection from toxic solvent vapors has been solved by proper ventilation, with the exception of the washing or soaking up of filter plates or cloths. This can be done in closed containers and if the men are properly educated and have a real appreciation of the hazard they will not stick their hands down into the bath and become poisoned by absorption. Where it is necessary for men to clean funnels over mixers, pack valves, change screen pots, etc., the paint spray mask does give very good protection and this type of mask is very light and comfortable to wear. It must, however, be remembered that this type of mask will only give protection for a very short time and where the concentrations are comparatively weak. In case of a break in a line, causing a bad spill, the canister type mask must be used and for this we recommend the all-service type.

Reducing the Clothing Hazard

Clothing worn by employees in plants of this kind very often becomes covered with nitrocellulose dope and this, of course, creates a very serious accident hazard to the employee. Great care should be taken in order to eliminate this hazard. The best practice, and one adopted by a great many industries in this line of work, is to insist that the men have clean suits

at least once a week. The flammable material can be washed out of the clothing with several different kinds of solvents.

Men going into acid tank cars should be equipped with hose masks and a harness to which there is a line attached and a man should be stationed at the opening of the tank car. Of course, care must be taken to wash properly any tank car before a man is allowed to enter. A great many different ways are used for checking up the amount of oxygen inside an acid tank or solvent tank car. The use of a flame, mechanical or electrical spark is extremely dangerous, as hydrogen may be present, especially if the car has contained sulfuric acid; and the use of animals is very unsatisfactory because there may be sufficient oxygen to sustain life in a small animal or bird and be insufficient to sustain life in a human being for any length of time. Danger signs should be placed at each end of the tank car.

Unloading Platforms for Safety

All unloading stations for tank cars should have a proper type platform which can be let down over the top of the car, making it possible for a man to do his work safely. Cars and tracks must be properly grounded to carry away any static charges. When connecting up for unloading cars that contain flammable solvents, the safest practice is to replace the dome cover with a temporary wood cover, and the man doing this work should be supplied with shoes which have leather soles; if these shoes have nails in them they should be of non-sparking metal. Any hammers or tools of any kind should also be of non-sparking metal to prevent the striking of sparks.

Experience has shown that steaming of cars which have contained flammable liquids is the best method of cleaning and this should be done for twenty-four hours before men are allowed to enter. Oxygen breathing apparatus should not be used for tank car work. It will give adequate protection, but if anything should go wrong it would be very difficult for a man to be taken out of a car with this apparatus fastened to him and the delay might result in a fatality. Hose masks can be used without a fan providing the length of hose does not exceed 25 feet, and no man should ever go into an empty tank or tank car without a life belt and line attached, and a man stationed on the outside.

The following emergency equipment should be supplied and kept in cabinets around every chemical plant: jacks, pipe wrenches, crowbars, rubber boots (hip type), masks, goggles, stretchers, acid hoods, electric flash lamps, rubber suits.

Probably the all-service type mask would be the most logical to supply for emergency work of this kind. However, it must be remembered that the all-service, or ammonia canister, mask is limited by the Bureau of Mines approval to respiratory protection in air that does not exceed three per cent concentration. When it is necessary to go into atmospheres which have a concentration above three per cent, the only equipment that will give adequate protection is the oxygen breathing apparatus, preferably the two-hour type. However, it must be kept in mind that men using the oxygen breathing apparatus must be properly trained in the use of this equipment. If the hazards in any plant necessitate equipment of this kind, a rescue squad should be organized and these men, after being trained, should be drilled at least once a month. I would suggest that the initial training, at least be done by the Bureau of Mines. It is also necessary to have this equipment inspected periodically by a man who is entirely familiar with the equipment.

New Incorporations

Equator Products and Chemical Co.—I. J. Light, 26 Court Street, Brooklyn, N. Y., $15,000.

Solvoid Co., Newark, manufacture chemicals—Furst & Furst, Newark, 1,000 shs com.

Fairfield Chemical Products Co., Wilmington, Del., chemicals—Corporation Service Company, 10,000 shs com.

Hansa Chemical Laboratory, Newark, manufacture chemicals—Samuel Voltaggio, Newark, 100,000 shs pf. 10,000 shs com.

Steenberg & Carman, Trumansburg, Chemicals-Stagg & Heath, Ithaca $12,000.

United Tung Oil Corp., Wilmington, land for growing and cultivating tung trees—Corporation Trust Company of America, 500,000 shs com.

Roxylite Corp., Newark, chemists—Harold Simandl, Newark, 100 shs com.

Calcium Carbonate Corp., Wilmington, limestone—Corp. Trust Co. of America 50,000 shs com.

Trainep Food Corp., Dover—U. S. Corp. Co., 50,000 shs com.

Chemco Assets Corp., Wilmington, Del., stocks, bonds—Corp. Trust Co. of America, $100,000.

The Parawaxco, Inc., Wilmington, Del., chemicals—Franklin L. Mettler, Wilmington, Del., $500,000.

Oakite Products Sales Corp., disinfectants—Holm, Whitlock & Scarff, 222 Fulton St., 200 shs com.

Clean Home Products Corp., Wilmington, Del., chemical products—Corporation Trust Company of America, $90,000.

Penn-O-Oil and Chemical Corp.—H. S. Hecheimer, 140 West 42nd St., $20,000.

B. T. Babbitt, Inc., New York City, soaps, oils, fat, chemicals—Prentice Hall, Inc., of Delaware, $10,000.

Drug Industries, Inc., New York City, chemicals—United States Corp. Co., 2,000 shs com.

Heath Service Laboratories, chemicals—Guggenheimer, Untermyer & Marshall, 120 Broadway, 200 shs com.

Oxidation Products Co., Inc., Wilmington, chemicals, medicines—Corp. Trust Co. of America, Wilmington, 10,000 shs com.

Windsor, Refrigerator Corp., Wilmington, chemicals—American Guarantee and Trust Co., 10,000 shs com.

Industrial Oxidation Corp., Wilmington, chemicals—Corp. Trust Co. of America, 10,000 shs com.

Tex Laboratories, chemicals—Watson & Looby, Albany, 100,000 shs.

Continental Chemical Corp., commission merchants—Siegeltuch, Butler & Kraft, 345 Madison Ave., $5,000.

Niagara Gypsum Co., Albany, machinery—Scott, Bancroft, Martin & Mackleiske, Chicago, Ill., 100 shs com.

The Gypsum Co., Wilmington, Del.—Corporation Trust Co. of America, $1,000,000.

The Nitrogen Industries Ltd., Toronto, Ont., $10,000 chemicals.—Harold L. Wright, Edna Fitzsimmons, Jessie M. Taylor.

Seeley Products, Ltd., Windsor, Ont., 2,000 no par value shares, chemicals, —John B. Aylesworth, James L. Braid, George C. Richardes.

Hanover Chemical Company, Montreal, Que. $20,000, Jean Martineau Frank B. Chauvin, Harold E. Walker.

Canadian Fine Color Company, Ltd., Toronto, Ont., $40,000,—Stewart K. Graham, Florence K. Graham, Arthur L. Fleming.

Chemical Facts and Figures

Carbon Black Export Association Formed Under Webb-Pomerene Act

Binney & Smith, United Carbon, Godfrey L. Cabot, J. M. Huber, Palmer Gas and R. W. Greeff, Representing Over 92 Per Cent of the World's Carbon Black, Form Latest Chemical Export Group—May Sell Through Centralized Agency.

Carbon Black Export Association, Inc., is formed under the Webb-Pomerene act by representatives of companies producing more than 92 per cent of the world's output of carbon black to promote the interests of American manufacturers of this commodity in foreign markets. The United States Bureau of Mines has reported that exports last year were 78,000,000 pounds, valued at $7,000,000. The incorporators of the new association estimate that exports in 1929 will exceed 100,000,000 pounds.

Companies represented in the export corporation are Columbian Carbon Co., Coltexo Corp., Keystone Carbon Co., and Texas-Louisiana Carbon Black Co., all represented in the negotiations by Binney & Smith Co.; United Carbon Co., including its subsidiaries, Kosmos Carbon Co., Eastern Carbon Black Co., and Crystal Carbon Co.; Godfrey L. Cabot, Inc., including Texas Elf Carbon Company, Cabot Co., Cabot Carbon Co., and Gas Products Co.; J. M. Huber, Inc., including J. M. Huber Co. of Louisiana, Inc., Ebony Carbon Co., Weston Carbon Co., and J. M. Huber Pigment Co.; the associated carbon black interests of Palmer Corp. and Electric Bond and Share Co., represented by Palmer Gas Products Corp.; and Texas Carbon Industries, Inc., represented by R. W. Greeff & Co.

The officers of the new corporation, which has been incorporated under the laws of Delaware, will be Norman Lee Smith, Binney & Smith Co., president; Edmund Billings, Godfrey L. Cabot, Inc., vice-president; R. H. de Greeff, R. W. Greeff & Co., secretary; G. A. Williams, United Carbon Co., treasurer, and H. W. Huber, J. M. Huber Co., assistant treasurer. The officers, together with John W. Herron, Palmer Gas Products Corp., will compose the board of directors of the association.

For the present members of the association will sell independently as before, but it has not been decided if they will continue on that basis or operate through one central selling agency.

International Combustion Corp. Placed in Hands of Receiver

International Combustion Engineering Corp., and its two subsidiaries, International Combustion Tar & Chemical Corp., and Combustion Engineering Corp., are placed in hands of receivers on application of Bethlehem Steel Corp. According to complaint, company owns stock in subsidiary corporations of a value of $43,000,000. It has debts allegedly unpaid of $250,000. It is alleged company is solvent but because of lack of liquid assets is unable to meet current obligations and that appointment of receivers is necessary to prevent disorganization as a result of creditors' suits.

Copper sulfocyanide is not a true cyanide nor a compound of cyanide within the meaning of the tariff law, and is therefore dutiable at 25 per cent as a chemical not specially provided for, the United States Court of Customs and Patent Appeals holds December 20.

Mathieson Petitions Lower Rate on Tank Car Liquid Chlorine

Mathieson Alkali Works, Inc., at hearing before Interstate Commerce Commission, in Washington, December 6 and 7, asks for a general reduction in the freight classification ratings on tank car liquid chlorine.

The Mathieson complaint asks for a reduction in the rating from Fourth to Fifth Class in the Official Classification, which governs in that part of the United States, roughly, east of the Mississippi River and north of the Ohio and Potomac Rivers; a reduction from Fourth to Seventh Class in Southern Classification Territory, which embraces the territory south of the Ohio and Potomac Rivers and east of the Mississippi River, and a reduction from Fourth to Fifth Class in Western Classification Territory, that part of the country west of the Mississippi River.

The Official Classification Territory embraces all of New England, all of New York State, all of New Jersey, Pennsylvania, Delaware and Maryland, all of Ohio, Indiana, most of Virginia, Illinois, Michigan and Wisconsin. A decision in the company's favor, therefore, will approximate a reduction as great as 30 per cent in the rating applicable to liquid chlorine within this area, reducing costs to consumers throughout that territory which, consumes about 80 per cent of all the liquid chlorine marketed. To the Southern consuming area a similar reduction in rating is applied for. To the territory west of the Mississippi River, described as Western Classification Territory, a decision for the company in this case would result in a reduction ranging from 27 to 32 per cent of the present freight rating.

Salesmen's Association Holds Annual Christmas Festivities

Casting tradition to the winds, the scene of the annual Christmas party of the Salesmen's Association moves this year from the Brevoort to the McAlpin, where on the eve of December 27, some two hundred of the "industry's finest" gathered in the grand ballroom to celebrate with adequate rites and ceremonies the annual holiday season. Great was the merriment and loud the revelry, both before and during the dinner and the entertainment of "bigger and better" nature which followed the dinner.

Victor E. Williams, Monsanto Chemical Works, president of the association has appointed standing committees for 1930. Chairmen of the respective committees are as follows: General affairs, A. A. Wasserschied, Mallinckrodt Chemical Works; entertainment and reception, Grant A. Dorland, MacNair-Dorland Co.; membership, F. A. Koch, Dow Chemical Co.; auditing, Frank E. Byrne, Monsanto Chemical Works; employment, J. A. Chew, Warner Chemical Co.; publicity, Ira P. MacNair, MacNair-Dorland Company.

Morningstar, Nicol, Inc., New York, is formed by consolidation of Joseph Morningstar & Co., Inc., and J. M. & J. S. Nichol, Inc., starches, dextrines and gums. Officers are president, Joseph Morningstar; chairman of the board, J. Millar Nichol; vice-president, George J. Muller; treasurer, Paul B. Owen, and secretary, Robert P. Morningstar.

Monsanto Chemical Works entertains a group of twenty-eight executives of Merrimac Chemical Co. at a dinner held December 21, at the Missouri Athletic Association, St. Louis. One hundred and twenty-seven attended the dinner.

Personal and Personnel

Dr. Arthur D. Little, chairman; Prof. James F. Norris, Prof. Frederick G. Keyes, Prof. Lyman G. Newell, Dr. Harrison E. Howe, Dr. Wilder D. Bancroft, Dr. Allen Rogers, Dr. Saul Dushman, Henry C. Mougey, Charles T. Roth, Dr. Colin G. Fink, Horace G. Byers, T. F. Bailey, Prof. H. D. Lukens, L. D. Vorce, Prof. C. J. Brockman and R. P. Shaw, secretary, Science Advisory Committee, attend first meeting of Chemistry Committee, Chicago World's Fair Centennial Celebration, held December 18, at the Hotel Roosevelt, New York.

Salmon W. Wilder, representing the Manufacturing Chemists' Association, and Victor M. O'Shaughnessy, representing the Industrial Alcohol Institute, Inc., are among the members of the advisory committee of 140 representatives of business organizations appointed by Julius H. Barnes, chairman of the executive committee of business leaders.

C. L. Gabriel, vice-president in charge of research and development, Commercial Solvents Corp., who had been located for the past six years at the company's Terre Haute, Ind., plant, transfers his headquarters to the New York offices of the company.

Pierre S. du Pont, chairman of the board, E. I. du Pont de Nemours & Co., Inc., is a member of the executive committee of the National Business Survey Conference, organized to recommend courses looking to continued stabilization of business.

Sterling Temple, technical director, Roessler & Hasslacher Chemical Co., addresses Vermont section, American Chemical Society, December 13, on "Some Phases of Research in Industrial Chemistry."

Charles Belknap, president, Merrimac Chemical Co., and Philip Stockton, president, First National Bank and First National-Old Colony Corp., Boston, are elected directors, Monsanto Chemical Works.

John A. Kienle, vice-president, Mathieson Alkali Works, is a member of a committee formed to protect the interests of preferred stockholders of International Combustion Engineering Corp.

George P. Calderwood announces that he has resigned as purchasing agent, L. H. Butcher Co., to take over a half interest in the Bright-Ellsworth Co., Inc., chemical Dealers, Los Angeles, Cal. He assumes the office of vice-president and general manager.

Dr. M. H. Haertle resigns as special representative of the Wood Chemical Institute, Inc., and plans a motor trip South with Mrs. Haertle.

Charles Piez, chairman of the board, Link-Belt Co., Chicago, is elected president, American Society of Mechanical Engineers.

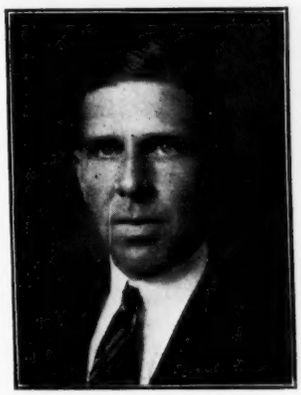
J. W. Rutland, formerly with International Agricultural Corp., is appointed manager, Baltimore office, H. J. Baker & Bro.

A. E. Cleghorn, formerly with Long Island University, takes position with Foster Dee Snell, consulting chemist, Brooklyn.

Howard Farkas, sales manager, U. S. Stoneware Co., is elected vice-president and a director of the company.

E. B. Nichols is appointed chief engineer, Brown Instrument Co., Philadelphia.

Department of Commerce Holds Chemical Meetings in New York



Homer S. Fox

Homer S. Fox, Assistant Commercial Attache, London office, Bureau of Foreign and Domestic Commerce, spends the week of January 6 at the New York office of the Department of Commerce. He has been specializing in chemicals in England for the past three years and spent the week in New York in a series of conferences with all those interested in the United Kingdom as a market for American chemicals and allied products.

The Department of Commerce also continued the series of conferences between C. C. Concannon, chief of the Department's Chemical and representatives of various chemical companies at the third "Chemical Day" held under the auspices of the New York office, on January 10. Increasing interest in these "Chemical Days" is apparent in the number of those coming with problems to discuss.

Charles B. Hall

Charles B. Hall, sales manager, chemical department, Cleveland-Cliffs Iron Co., Cleveland, dies December 22, aged 60. He was born in Glenhall, Ind., and received his education at Purdue University. For a number of years he was Chicago manager, W. H. Hutchinson & Son. Later he went with the Lennox Chemical Co., Cleveland, serving as general manager from 1910 to 1916. In the latter year he became associated with the Cleveland-Cliffs organization as sales manager of the heavy chemical department, which position he held at the time of his death. He was a Mason, and belonged to the Chicago Athletic Club, the Salesmen's Association, the Drug & Chemical Club, and the Chemists' Club, New York.

John I. Tierney

John I. Tierney, secretary, Manufacturing Chemists' Association, dies in Washington, D. C., December 23, aged 54. He was born in Worcester, Mass., September 10, 1875, went to Colorado as a youth, where he engaged in newspaper work and later, from 1913 to 1915, was State senator. Following this, he went to Washington as secretary to the late Senator J. F. Shafroth of Colorado, and in June, 1919, he was appointed secretary, Manufacturing Chemists' Association. He was a member of the National Press Club, the Denver Press Club, the Congressional Country Club, and the Monday Luncheon Club.

Stuart Wyeth, president, John Wyeth & Sons, Inc., Philadelphia, dies suddenly January 2, aged 67. He was a graduate of the Law School of the University of Pennsylvania, Class of 1887. Following the death of his father, John Wyeth, he was elected president of the company.

Dr. Berthold Wuth, dyestuffs expert dies at Badenweiler, Germany, December 28, aged 54. He was born in Church, England, August 30, 1875, educated in Germany, and for many years was with the Society of Chemical Industry, Basle, Switzerland, and the Ciba Co., Inc., New York.

John S. Lowman, president, Philadelphia Rubber Works Co., Akron, Ohio, dies December 9.

News of the Companies

Atmospheric Nitrogen Corp.'s patent on the synthetic ammonia catalyst process is upheld December 20, by the United States Court of Customs and Patent Appeals. Court awarded priority of invention to Frederik W. DeJahn, chemist for the aforesaid corporation over the claims of John C. Clancy. The latter admitted the former's priority of conception, but declared that diligence had not been shown in reducing it to practice. Court held that sufficient diligence had been exercised.

Bakelite Research Club holds annual dinner and dance December 14 at the Caldwell Woman's Club, Caldwell, N. J. C. L. Chamberlin, works manager, Bloomfield plant of the Bakelite Corp., was toastmaster, and the speaker of the evening was Dr. L. V. Redman, who spoke on, "The Time Factor and Achievement in Research." Dancing and entertainment followed the dinner.

E. I. du Pont de Nemours & Co., Inc., extends accident and health insurance to about 30,000 employees through a contributory group accident and health insurance contract with the Equitable Life Assurance Society. New insurance supplements group life insurance now amounting to $24,000,000.

Merck & Co. rents three floors in the Butterick Building, 223 Spring st., New York, for a period of five years. The company's present building at 145 Front st. will be sold and the New York offices moved to the Butterick Building.

Hercules Powder Co. issues new 51-page booklet describing its chemical products. Copies will be furnished upon request. Company also announces sale of wood rosin in barrels on a net weight basis.

American Agricultural Chemical Co. arranges group insurance plan by which each of its permanent employees may be insured for $1,000 without medical examination, the company paying over half the premium.

American Cyanamid Co. is granted patent covering new fumigant consisting of a solution of cyanogen chloride and hydrocyanic acid in the liquid state. Outstanding feature is low melting point.

Kalbfleisch Corp. purchases group insurance for all employees who have been with company six months or more. The insurance is without charge to employees under a policy issued by the Prudential Life Insurance Co.

Rossville Commercial Alcohol Corp. issues No. 59 of "Rossville Alcohol Talks," which discusses the history of the shoe industry.

Roessler & Hasslacher Chemical Co., New York, opens a new branch office in Toronto, Ontario, Canada, with Parke H. Masters in charge.

Monsanto Chemical Works issues special Merrimac issue of "Monsanto Current Events," in which the personalities and activities of the most recent acquisition are fully described.

Charles Cooper & Co., New York, publishes a new, revised, 12-page price list, copies of which will be furnished upon request.

Ciba & Co. announces removal of San Francisco office to 1219 Folsom st.

Synthetic Organic Manufacturers Re-Elect August Merz President

Synthetic Organic Chemical Manufacturers' Association re-elects following officers at annual meeting held in the hotel Commodore, New York, December 13: president, August Merz, Heller & Merz Co., Newark; treasurer, Albert J. Farmer, Pharma Chemical Co., New York; and secretary Charles A. Mace. Vice-presidents, who are also chairmen of the divisions of the associations, were elected as follows: W. S. Weeks, Calco Chemical Co., for the dye section; E. G. Robinson, E. I. du Pont de Nemours & Co., for crudes and intermediates; Ralph E. Dorland, Dow Chemical Co., for fine organic and medicinal chemicals; and F. G. Zinsser, Zinsser & Co., for the special chemicals section.

Others elected members of the board of governors were E. A. Barnett, John Campbell & Co.; R. W. Cornelison, Peerless Color & Chemical Company; E. H. Killheffer, Newport Chemical Works; E. H. Klipstein, E. C. Klipstein & Sons Co.; S. W. Wilder, Merrimac Chemical Co.; John W. Boyer, Monsanto Chemical Works; A. L. Van Ameringen, Van Ameringen-Haibler, Inc.; Glen Haskell, U. S. Industrial Alcohol Co., and A. Cressy Morrison, Carbide & Carbon Chemicals Crop.

Monsanto Chemical Works Acquires English Tar Distiller

Monsanto Chemical Works, through its European subsidiary Graesser-Monsanto Chemical Works, London, purchases Sunderland tar distilling works of Brotherton & Co., Durham, England. Plant has annual distilling capacity of 60,000 tons of tar and will help supply crude tar requirements of Graesser-Monsanto. Other products are creosote, oil, pitch, naphthalene, and pyridine.

This step is the most recent in the Monsanto program of expansion which previously had included acquisition of the Merrimac Chemical Co.; the Commonwealth division, Mathieson Alkali Works; Rubber Service Laboratories Co.; Elko Chemical Co. The Graesser-Monsanto Co. had also previously acquired the British Saccharin Manufacturing Co.

E. M. Allen Appointed Chemical Representative on Hoover Council

E. M. Allen, president, Mathieson Alkali Works, represents the chemical industry on the committee of seventy-two "key" men, appointed by the business conference held in Washington, December 5, to organize the nucleus of a continuing economic council, whose purpose it is to prevent a business depression. Speaking before that conference, the president of the Mathieson company was warmly applauded for the following statement:

"If the United States Senate will only relieve the uncertainty, business will go forward.

"It is about time for the agricultural and industrial business men to impress upon certain Senators that they are United States Senators. I'm surprised that this has not been touched upon earlier."

Chemical Club of Philadelphia elects following officers: president, George F. Applin, Mallinckrodt Chemcal Co.; vice-president, A. J. Jewell, Schuylkill Chemical Co.; secretary, J. M. Rosenbeger, Smith, Kline & French, Inc., and treasurer, John Hans, E. I. du Pont de Nemours & Co., Inc. The speaker was Williams Haynes, publisher, CHEMICAL MARKETS, and only honorary member of the club.

E. I. du Pont de Nemours & Co., Inc., announces retention of four new chemists: T. E. Dill, G. E. Faulkenberry, G. W. Wilson, and Barry V. Cornwall.

Chilean Nitrate Producers Plan Production Curtailment

Chilean nitrate producers propose following plan for curtailing production. The excess production of Chilean nitrate beyond the present world demand is estimated to be between 400,000 tons and 500,000 tons annually. By the closing down of the less efficient producers it should be possible to eliminate this excess.

It is proposed, therefore, that the expensive producers shall be invited to close down their plants, under a system of bonus compensation from the producers who continue in production. Applications for inclusion in the scheme will be received up to January 31, 1930, from producers representing an agregate output of up to 600,000 tons per annum. The rate of yearly output will be reckoned on the nitrate year, July 1, 1928, to June 30, 1929.

After February 1, 1930, the producers who close down their plants under the scheme will be allowed to dispose of their accumulated stocks in the normal way under the central selling scheme. It is calculated that the stocks of these producers should be disposed of by the beginning of the next nitrate year on July 1, 1930.

After a producer's stocks have been sold the compensation scheme will come into operation, by which a concession will be made on the rate of property tax to be paid by those oficinas which are closed under the scheme. Details have not been published of this tax remission, but it is not expected to amount to as much as an originally proposed subsidy of 6d. per metric quintal. The production of the whole industry is to be linked closely to sales by regulating the individual producer's sales quota according to his production. For those oficinas closing under the scheme, a quota will be calculated on their output since July 1, the beginning of the current nitrate year.

Commercial Solvents Corp. is Granted Formaldehyde Patent

Commercial Solvents Corp. is granted patents covering processes for production of formaldehyde and formic acid. Formaldehyde patent covers a process by which a mixture of carbon monoxide and water vapor is passed over a catalyst comprising the oxide of a metal forming a weak base.

This is done at temperatures of between 150 and 350 degrees C., and at a pressure of 10-500 atmospheres. A suitable combination of temperature, pressure and gas mixture is selected so the water vapor is not appreciably condensed to the liquid form.

The process covering formic acid consists of subjecting to the action of a cuprous halide catalyst a gas mixture which is obtained by the partial conversion of carbon dioxide and hydrogen to carbon monoxide and water.

Insecticide & Disinfectant Manufacturers' Association elects following officers at sixteenth annual convention at Commodore Hotel, New York, December 9 to 11: president, Dr. Robert C. White, R. C. White Co., Philadelphia; vice-presidents, Evans E. A. Stone, William Peterman & Co., New York, and John Powell, John Powell & Co., New York; secretary, Harry W. Cole, Baird & McGuire, Inc., Holbrook, Mass.; and treasurer, Robert J. Jordan, William Jordan & Bro., Inc., New York.

Mercurio Europeo, Lausanne, Switzerland, sales bureau for Italian and Spanish quicksilver producers, offers a prize of £5,000, in an international competition to discover a new and important use for quicksilver. Details regarding the prize offer may be secured from the home office of the organization or from the Leghorn Trading Co., New York, sales agent for the United States and Canada.

Industrial Alcohol Production Reduced 15 Per Cent for 1930

Industrial alcohol production for 1930 is reduced by 15 per cent as compared with last year's output, according to an order issued by Commissioner of Prohibition, Dr. James M. Doran. Last year's production totaled about 200,000,000 gallons. This reduction as fixed by Commissioner Doran was accepted without protest by industries using alcohol, because they anticipate less business in 1930 than last year, although there is an agreement for a review of the situation in case there should be a substantial revival of industry.

Alcohol production increases substantially during the year ended June 30, 1929, totaling 200,832,000 gallons according to the commissioner's annual report. He accounts for the increase as follows:

"An increase of several million automobiles registered in the United States has required additional millions of gallons of completely denatured alcohol for anti-freeze purposes and a tremendous quantity of special denatured alcohol to furnish lacquers, which are now used exclusively in finishing automobiles.

"There has been an expanding market for lacquers manufactured from specially denatured alcohol to finish furniture and the interior of residences. The tremendous expansion of the rayon industry has required additional millions of gallons of specially denatured alcohol.. The growth and expansion during the fiscal year of the chemical industries has also required more alcohol, which is the basic raw material used in thousands of preparations and processes.

"The alcohol industry, facing a higher duty on blackstrap molasses in the present pending tariff bill, produced the last six months of the fiscal year a much greater per cent of their alcohol quota for the present calendar year than is the usual custom in the trade.

"This accounts for a substantial increase, which will no doubt be reflected in a lowered production for the last six months of the calendar year.

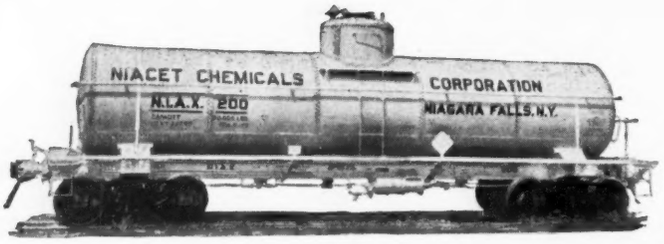
"During the fiscal year the industries withdrew from bond, tax free for denaturation, 182,778,000 proof gallons of alcohol and rum, a heavy increase over the year before, Mr. Doran said. The total production of denatured alcohol was 106,960,000 wine gallons, of which 52,405,000 were completely denatured and the remainder specially denatured."

A. C. S. Elects McPherson

American Chemical Society elects following officers: president, Prof. William McPherson, dean, graduate school, Ohio State University; president-elect, Moses Gomberg, professor of chemistry, University of Michigan; directors, James F. Norris, Massachusetts Instutite of Technology, and Charles L. Reese, E. I. du Pont de Nemours & Co.; councilors-at-large, Edward Bartow, Iowa State University; S. C. Lind, University of Minnesota; Hugh S. Taylor, Princeton University; and David Wesson, Montclair, N. J.

American Tar Products Co., Pittsburgh, purchases White Tar Co., Kearny, N. J. Ralph Gretsch will continue as sales manager, White Tar Co. E. W. Van der Wolk will be in charge of production, succeeding H. W. Hamilton, who goes to Pittsburgh as assistant general manager. J. N. Forker, president, American Tar Products Co., will also be president of the White Tar Co., while S. H. Bell will be general manager.

Canadian Industrial Alcohol Co. is about to merge interests with Hiram Walker-Gooderham & Worts, according to reports from Montreal.



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American Potash & Chemical Gains Large Searles Lake Interest

American Potash & Chemical Corp. now holds large interest formerly held by Goldfields American Development Co. in the operations at Searles Lake. Some interesting particulars concerning British capital in the American potash and borax industry were given at the general meeting of Consolidated Goldfields of South Africa, Ltd., by Lord Harris, chairman. The concern has investments in a wide variety of industrial concerns all over the world and, so far as the United States is concerned, its operations are largely carried out through its subsidiary the Goldfields American Development Co., says "The Chemical Trade Journal." This last-mentioned company has had for many years a strong financial interest in the fortunes of the American Potash and Chemical Corp. and, it seems safe enough to assume from the remarks of Lord Harris, has been primarily responsible for the financing of the Searles Lake enterprise during its difficult years of development. The success that has since attended the operations of the American Potash and Chemical Corp. has now induced the American Goldfields concern to sell out its holding, with the approval of its London principal, apparently, although not directly indicted by Lord Harris, to the Searles Lake company itself. Despite this transfer of shares, however, the Goldfields American Development Co. is to retain the technical and commercial management of the Searles Lake undertaking for a term of years.

German Benzol Production Up 20 Per Cent Over Last Year

Benzol Verband reports that German benzol production this year has been about 20 per cent higher than in 1928. Despite this increase, however, demand has been so vigorous that deliveries have had to be made from stock. This demand is due to the increasing use of benzol-benzine mixtures in place of both benzine and benzol themselves. The report refers to the general tendency all over the world for the utilization of these mixtures, and concludes by pointing out that the general ton of the benzol market is firm and that prices are very likely to remain at their present level.

Etablissements Kuhlmann, plans to acquire control of the Societe des Fours a Coke de Selzaete, a Belgian company, with a capital of 50,000,000 francs, in which Kuhlmann already holds an important interest. The operation will be brought about through a subsidiary, Societe d'Interets et d'Entreprises Chimiques, which has just been given the right to subscribe to a total amount of 12,500,000 francs in new Kuhlman shares. The Kuhlmann subsidiary will accordingly proceed to acquire the Belgian concern by an exchange of shares.

Synthetic Coal & Oil Products, Ltd., is formed in Syndey, Australia, as an I. C. I. subsidiary, with capital of £50,000 to establish the production of oil from brown coal. Company proposes to acquire brown coal leases at Gelliondale, South Gippsland.

I. G. Farbenindustrie wins exclusive right to initials "I. G." according to a decision of the Reischsgericht in the case brought by the chemical cartel against another company claiming that designation.

Dyestuffs department, E. I. du Pont de Nemours & Co., Inc., announces a new line of azoic colors for printing, "Du Pont Naphthanil Diazo Colors for Printing."

Societe Anversoise de Produits Chimiques, Antwerp, Belgium, is formed to succeed and carry on the business of G. A. Steffens.

Howards & Sons, Ltd., Ilford, England, announces the first and only British made ethyl lactate and diacetone alcohol.

Germany's Nitrate Industry Moves Against Overproduction

I. G. Farbenindustrie concludes truce with other members of Germany's nitrate industry towards an agreement aimed to curtail overproduction. Increased production by the new independent plants in the Ruhr has proved a thorn in the side of the syndicate this year and is said to have been responsible for cutting the profits of the syndicate's plants. The syndicate's annual production basis of between 700,000 and 800,000 tons of primary nitrogen has recently undergone a reduction and men have been laid off at the huge plants at Merseburg and Appau, although the I. G. officials contend that its nitrogen sales are ahead of last year. Notwithstanding, wages are higher and, through the world agreement with Chilean and British producers reached early this year, prices obtained are lower.

The Ruhr plants on the other hand apparently are doing well and are able to produce nitrogen products at low cost owing to the nearness of adjoining lignite coal deposits. Foremost among these companies are the byproduct ammonia enterprises of the Ruthrchemie Aktiengesellschaft and the Gasverarbeitung Aktiengesellschaft, which contributed last year, while still in an experimental stage, some 43,000 tons of ammonium sulfate to the total.

Production of the new fertilizer, Montansalpetre, through the Mont Cenis process by the Gasverarbeitung A.-G. was started as a competing product with the syndicate's "Leunasaltpetre," and while the output attained only about 20,000 to is in 1928 its production was increased considerably this year.

The Ruhrchemi A.-G. also introduced a new fertilizer on the market known as "Kalkammon," or ammonia chalk, obtained in a Casale process of mixing ammonium chloride and calcium carbonate. The Ruhr companies increased their total production some 13 per cent last year and undoubtedly quickened their strides during 1929.

The I. G. Farbenindustrie interests a short while ago are said to have demanded that the Ruhr manufacturers refrain from erecting new plants. Whether the independents acceded to this demand in the agreement just signed could not be learned, but it is learned in responsible quarters that the Ruhr interests will be granted production quotas. These will be fixed in later con ferences with the German Nitrogen Syndicate.

American Association of Textile Chemists and Colorists elects following officers at its ninth annual meeting, in the Bellevue-Stratford Hotel, Philadelphia, December 6 and 7: president, Dr. E. H. Killheffer, Newport Chemical Works, Passaic, N. J.; vice-presidents, Walter S. Williams and P. J. Wood; secretary, Alex. Morrison, American Woolen Co., Andover, Mass.; treasurer, Winthrop C. Durfee; and chairman of the research committee, Professor Louis H. Olney, Lowell Textile Institute, Lowell, Mass.

American Institute of Chemical Engineers elects following officers at annual convention at Grove Park Inn, Asheville, N. C., December 2-4: president, Alfred H. White, University of Michigan; vice-president, J. C. Olsen, Brooklyn Polytechnic Institute; secretary, H. C. Parmalee, McGraw-Hill Publishing Co.; treasurer, M. H. Ittner, Colgate-Palmolive-Peet Co.; and auditor, David Wesson.

American Manganese Fertilizer Corp., Alexandria, Va., is formed with capital of $550,000 to explore, develop and operate mines and manufacture fertilizers. Albert S. Dulin is president.

Newport Chemical Works, Inc., Passaic, N. J., announces a new fast dye, Acid Anthraquinone Blue Sawsa.

Holly Pneumatic Systems, Inc., announces that F. G. Dunbar & Son is now its Chicago agent.

The Financial Markets

Du Pont Increases Stock Holdings In Canadian Industries, Ltd.

Now Holds 46 Per Cent of Total of Canadian Company's Outstanding Stock—Brings Total to 286,364 Shares—Du Pont Also Lists Additional Common for Bonus Purposes.

E. I. du Pont de Nemours & Co. increases stock holdings in Canadian Industries, Ltd., to 46 per cent of the latter's total outstanding stock.

The 16,761 additional shares issued by du Pont will be exchanged for 12,416 shares of the Canadian company, making its holdings in the foreign enterprise 286,364 shares.

Canadian Industries, Ltd., through its numerous subsidiaries, is a foremost producer of explosives, Fabrikoid, paints and varnishes, including Duco, Pyralin, heavy chemicals and fertilizers. Its subsidiary companies and their products follow:

Canadian Explosives, Ltd.—Commercial explosives and accessories. Dominion Cartridge Co., Ltd.—Shot shells, metallic cartridges and primers; railway fuses and signals, etc. Canadian Fabrikoid, Ltd.—Fabrikoid and rubber coated fabrics used as leather substituted, window shade cloth, etc. Flint Paint and Varnish, Ltd.—Varnishes and enamels; oil colors, industrial paints; Canadian manufacturers of Duco. Arlington Co. of Canada, Ltd.—Pyralin combs, tooth brushes, toiletware. Canadian Ammonia, Ltd.—Anhydrous ammonia and aqua ammonia. Canadain Salt Co., Ltd.—Salt, chlorine products, caustic soda and alkalis. Grasselli Chemical Co., Ltd.—Acids and heavy chemicals. Triangle Chemical Co., Ltd.—Superphosphates and complete fertilizers, acids, etc.

Canadian Industries, Ltd., is also affiliated with Imperial Chemical Industries, Ltd.

E. I. du Pont de Nemours & Co. applies to the New York Stock Exchange to list 160,000 additional shares of common stock, to be used for the payment of the annual stock bonus to employes and for executive trust purposes. Heretofore, the company has gone into the open market to purchase this bonus stock, but last year the corporation's charter was amended to permit the issuance of unissued stock for these purposes.

National Distillers Products Corp. Reports 10 Months' Profit of $507,057

National Distillers Products Corp. and subsidiaries report for ten months ended October 31, 1929, profit, exclusive of amount received from sale of capital assets, of $507,057 after depreciation, interest, etc., but before taxes.

Consolidated income account for ten months ended October 31, 1929, follows: Net sales $1,942,747 costs and expenses $2,074,714; operating loss $131,967; miscellaneous income $467,727; proportion of earnings of Old Time Molasses Co. and Eastern Alcohol Corp., $379,095; total income $714,855; interest $145,259; depreciation $62,539; profit $507,057.

Clorox Chemical Co. declares regular quarterly dividend of 50 cents, payable January 2 to stock of record December 20.

Monsanto Chemical Works Shows Nine Months' Profit of $1,381,481

Monsanto Chemical Works and subsidiaries report for nine months ended September 30, 1929, consolidated net profit of $1,381,481 after charges and federal taxes, equivalent to $3.64 a share on 398,293 no-par shares of stock.

Statement of Monsanto Chemical Works, after giving effect to recent acquisitions, as of September 30, 1929, shows total assets of $24,393,286 and total surplus of $5,527,473. Current assets amounted to $7,337,243 and current liabilities $1,523,471.

Consolidated balance sheet of Monsanto Chemical Works as of September 30, 1929, giving effect to (a) issuance on October 1, 1929, of 4,498 shares of stock at a 1½% quarterly stock dividend; (b) issuance on November 15, 1929, of 87,441 shares of stock for acquisition of business, assets and properties of Merrimac Chemical Co., and for services rendered in connection therewith, transfer of such business, assets and properties to the Merrimac Chemical Co., Inc., and the issuance of all of capital stock of Merrimac Chemical Co., Inc., to Monsanto Chemical Works, follows:

Assets: Land, buildings, machinery, etc., $16,813,696; patents and processes $2, cash and call loans $946,565; government certificates and municipal bonds, at cost $1,089,275; notes and acceptances receivable $35,624; accounts receivable $1,652,821; inventories $3,375,074; prepaid insurance, taxes, etc., $237,883; investments in other companies, at cost $63,635; deferred charges $178,711; total $24,393,286.

Liabilities: Capital stock, represented by 398,293 no-par shares $6,638,217; funded debt $1,751,500; purchase money obligations $422,281; notes payable $140,000; accounts payable $899,264; accrued interest, taxes, etc., $97,813; reserve for income taxes $292,786; dividend payable $93,617; reserves for depreciation and replacement $5,847,594; other reserves $2,682,751; capital surplus $2,975,276; earned surplus $2,552,197; total $24,393,286.

American Commercial Alcohol Declares 2% Stock Dividend

American Commercial Alcohol Corp. declares a 2% stock dividend and regular quarterly dividend of 40 cents on common, both payable January 15 to stock of record December 20. In July, company paid a stock dividend of 3%.

Company also declared regular $1.75 quarterly dividend on preferred, payable February 1 to stock of record January 10, which is the last preferred dividend payable on the preferred, as the issue has been called for redemption on February 1.

Chemical Stocks at Auction

United Chemicals, Inc., common stocks sells at auction at $2,000 per lot of 100 shares; and again at $50 per lot of 84 shares. California Cyanide Co., Inc., 200 shares preferred and 200 shares of common, $100 lot. Celluloid Corp. 700 shares common, $13 per share.

United Chemicals, Inc., 10 shares of common stock, are offered at auction at $100 lot.

Phosphate Mining Co., 500 shares, are offered at auction at $50 per share.

Atlas Powder Co. Declares Regular 1½% Quarterly Dividend

Atlas Powder Co. declares regular quarterly dividend of 1½% per cent on preferred capital stock, payable in cash February 1, to holders of record January 20. Company also segregates explosives department under direction of W. T. Penniman, formerly general manager, explosives department, Canadian Industries, Ltd. The latter was also elected a director of the company and E. W. Maynard elected a vice-president.

Atlas Powder Co. reports for nine months ended September 30, 1929, net income of $249,056 after federal taxes, etc., equivalent after 6% preferred dividends, to $6.29 a share on 261,438 no-par shares of common stock. This compares with $1,604,339 or $4.59 a share on common in first nine months of 1928. Net income for September quarter totaled $854,330 after above charges, equal to $2.75 a share on common, against $629,469 or $1.89 a share on common in third quarter of 1928.

United Piece Dye Works Places Common on $2 Annual Basis

United Piece Dye Works declares four regular quarterly dividends of 50 cents each on common, payable February 1, May 1, August 1 and November 1, 1930, to stock of record, respectively, January 15, April 15, July 15 and October 15. Company paid an annual dividend of $4 on February 21, 1929, and in March the stock was split-up two for-one. The present 50 cents quarterly dividends place the stock on a $2 annual basis, equivalent to the $4 annually paid prior to the split-up.

Archer-Daniels-Midland Quarter Net at $458,165

Archer-Daniels-Midland Co. and subsidiaries report for quarter ended November 30, 1929, net profit of $458,165 after depreciation, federal taxes, etc., equivalent after dividend requirements on 7% preferred stock, to 71 cents a share on 549,546 no-par shares of common stock now outstanding. This compares with $417,849 or $1.42 a share on 240,426 common shares in November quarter of 1928.

U. S. I. Declares $1 Extra

U. S. Industrial Alcohol Co. declares an extra dividend of $1 and regular quarterly dividend of $1.50 on the common, payable February 1 to stock of record January 15.

American Cyanamid Co. declares regular quarterly dividends of 40 cents each on the Class A and Class B common stocks both payable January 2, to stock of record December 14.

Freeport Texas Co. declares an extra dividend of $1 and regular quarterly dividend of $1, both payable February 1 to stock of record January 15.

Liquid Carbonic declares regular quarterly dividend of $1 on common, payable November 1 to stock of record October 19.

Paramet Chemical Corp., New York, increases capital from $60,000 to $150,000.

Clorox Chemical Co., San Francisco, declares 2 per cent stock dividend.

Lautaro Nitrate Co. Reports Profit of $2,065,312 For Year

Lautaro Nitrate Co., Ltd., reports for year ended June 30, 1929, profit of $2,065,312 after depreciation, expenses and interest but before taxes.

Income account for year ended June 30, 1929, follows: Net sales $22,238,746; costs and expenses $18,870,396; depreciation $1,146,857; other income (net) $667,604; interest $823,785; profit $2,065,312.

Balance sheet of Lautaro Nitrate Co., Ltd., as of June 30, 1929 (conversions of the company's accounts from pounds sterling into United States dollars having been made at the rate of $4.8665 to the pound), follows:

Assets: Property buildings and equipment, after depreciation, $48,225,316; cash, $835,249; cash deposit with respect to proposed issue of bonds, $559,953; sundry debtors and suspense items, $1,615,430; inventories, $12,129,781; investments $6,891; deposits in guarantee and guarantee for workmen's accident pension (contra), $276,948; total, $63,649,568.

Liabilities: Capital stock, represented by 1,600,000 shares, par £5, 7% cumulative preferred and 2,000,000 shares, par 1 shilling, ordinary stocks, $38,932,000; 6½% first mortgage debenture stock, $10,974,808; bankers for guarantees (contra), $153,870; bank overdrafts, $907,431; accounts and bills payable, $2,129,578; reserve for taxes, $154,504; export duties, $64,795; unclaimed dividends, $27,577; customers' advances, $4,413,542; mortgage guarantee for workmen's accident pension (contra), $123,078; reserve for workmen's accident insurance and pensions, $225,986; fire insurance fund, $391,909; employes' pension fund, $72,997; profit and loss, $5,077,493; total, $63,649,568

Canadian Industrial Alcohol Reports Year's Net of $2,073,977

Report of Canadian Industrial Alcohol Co., Ltd., for year ended September 30, 1929, shows net profit of $2,073,977 after depreciation, federal taxes, etc., equivalent to $1.89 a share earned on 1,092,915 no-par shares of combined Class A and Class B stocks. This compares with $3,136,680, or $2.87 a share, on 1,091,666 combined shares in previous year.

The 1929 net profit is after deducting $475,000 as year's share of $1,404,000 due to government for back taxes. The remaining $929,000 will be paid over a period of next two years.

I. G. Farbenindustrie already controlling about 20,000,000 crowns investment in the 76,000,000-crown capital of Norsk Hydro (Norwegian air fixation enterprise), plans to increase its participation. The Norsk Hydro plans to increase its capital to 102,000,000 crowns, but the amount that the I. G. will take has not been announced, according to the Department of Commerce.

The Norsk Hydro capital increase will carry extensions proposed for a production of 90,000 metric tons fixed nitrogen, partly by the arc process but mostly by the Haber-Bosch process, introduced there since the I. G. became interested.

Norsk Hydro announced net profits of slightly over 4,000,000 crowns for the fiscal year ended June 30, 1929, against only 1,313,000 crowns earned during the previous year. (1 crown—$0.2674 United States currency.)

E. Merck, of Darmstadt, forms a holding company in Zurick, with a capital of 3,000,000 Swiss francs, under the name Holding A.-G. fur Merck-Unternehmungen. Capital is held entirely by the firm. Into this holding company will be brought all the German, European and overseas branches of E. Merck. This action has been taken as a result of the favorable financial conditions in Switzerland. The capital needs of the Darmstadt concern will be covered by the holding company.

The Industry's Stocks

1929 Dec. 31 High	1929 Dec. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Dec.	Sales During 1929	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$	1929-1928	1927
								NEW YORK STOCK EXCHANGE						
124¼	120½	223¾	77	99¾	59	251,700	2,429,400	Air Reduction	No	769,000	$3.00	9 mo.	5.63	4.61
265	262	354½	197	252½	146	31,600	973,020	Allied Chem. & Dye	No	2,287,014	6.00	1928	11.12	10.03
121	121	125	118½	...	...	2,900	43,800	7% pfd	100	392,849	7%	1928	68.63	62.59
7	7	23⅜	4	26	15¾	17,100	203,900	Am. Agricultural Chem.	100	333,221	...			1.59
26½	26½	73¼	18	79½	55¾	18,600	104,400	pfd	100	284,552	...		2.47	7.86
123½	120½	184½	86	117¾	70¾	627,300	6,108,400	American Can	25	2,473,998	4.00	1928	6.86	4.11
142½	142½	145	133½	147	136½	4,300	46,900	pfd	100	412,333	7%	1928	48.17	31.66
32½	31¼	55	20	87½	74	82,000	505,300	Amer. Com. Alc.	No	380,000	1.60	9 mo.	2.59	3.39
46⅜	45½	81¾	31½	63½	39	97,100	2,214,300	American Metal, Ltd.	No	868,000	3.00	6 mo.	1.73	3.58
116	112	135	106	117½	109	1,400	33,800	pfd	100	69,000	6%	6 mo.	24.10	26.52
72½	70⅜	130½	62	293	169	238,400	4,139,600	American Smelt. & Refin.	No	1,830,000	4.00	6 mo.	5.03	8.24
135	135	138	123½	142	131	3,800	45,600	pfd	100	500,000	7%	6 mo.	21.90	37.17
9	8½	49½	7	57	6⅜	28,600	740,400	Amer. Zinc & Lead	25	200,000	...	3 mo.	0.97	...
55½	55½	111½	49½	117½	40	5,000	91,600	pfd	25	96,560	6.00	3 mo.	3.92	d5.99
75⅛	73	140	67½	120½	53⅛	1,431,925	33,496,525	Anaconda Copper Mining	50	8,796,000	7.00	1928	6.63	3.37
24½	23¾	49½	18½	112½	55½	35,800	555,000	Archer Dan. Mid.	No	481,000	2.00	9 mo.	0.49	8.04
24½	24	...	...	...	...		2,120	pfd	100	41,000	7%	9 mo.	22.10	46.94
83½	80	140	67	114	63	14,600	303,300	Atlas Powder Co.	No	261,438	4.00	9 mo.	6.29	4.30
100	100	106½	90	110½	102	490	7,210	pfd	100	90,000	6%	9 mo.	22.77	18.76
38	37½	77⅛	30	66½	50	210,800	6,943,500	Atlantic Refining	25	2,670,000	1.00	6 mo.	3.06	7.72
3½	3½	9½	2	12½	4½	27,100	433,400	Butte Copper & Zinc	5	600,000	...	9 mo.	0.27	0.31
5	4½	12½	4⅜	16½	8½	6,600	162,900	Butte Superior Mng.	10	290,198	2.00	1928	0.28	0.94
27⅞	22½	47½	20	122	65	22,700	579,000	By Product Coke	No	760,000	1.00	9 mo.	2.10	6.59
1	1	4	1	5⅜	1⅜	18,700	283,600	Calla Lead & Zinc	10	724,592	...	6 mo.		
29½	28⅜	61½	25	47⅜	20½	50,600	2,548,100	Calumet & Hecla	25	2,001,000	4.00	6 mo.	1.24	1.55
14⅜	12½	32	10⅞	119	61½	25,600	362,300	Certainteed Prod.	No	400,000	...	6 mo.		
14	11½	81½	45½	63½	23¼	600	11,100	7% pfd	100	62,904	7%	6 mo.	10.63	6.77
74	55⅜	127½	53	74½	37⅜	500	1,335,200	Chile Copper	25	4,415,497	3.50	6 mo.	3.32	4.52
174½	167½	344	105	134½	79	166,100	924,700	Columb Carbon	No	457,000	4.00	6 mo.	4.56	6.30
31⅜	30½	63	20½	250¼	137½	879,400	2,691,400	Commercial Solvents	No	227,000	8.00	6 mo.	7.94	13.20
51⅞	50½	92	40½	64½	53	128,800	4,184,400	Cont. Can	No	1,714,000	2.50	1928	4.35	7.55
...	...	...	...	128	123		2,280	pfd	100	49,000	7%	1928	135.66	86.82
92½	88	126⅜	70	94	64⅜	119,000	2,326,200	Corn Products	25	2,530,000	3.00	6 mo.	2.36	4.35
90½	88½	144½	137	146½	138½	1,970	33,550	pfd	100	250,000	7%	6 mo.	27.46	50.98
29⅜	28½	69½	21½	68¾	34⅜	137,600	1,594,400	Davison Chem.	No	504,000	...		3.34	11.58
33⅜	31½	64½	24	61	40	9,800	195,200	Devoe & Rayn A	No	160,000	2.40	6 mo.	†2.87	†5.95
34	31⅜	115½	102	120	108	70	3,040	1st pfd	100	16,000	7%	6 mo.	31.54	64.02
116½	116	119½	107½	121½	114	7,100	95,500	Dupont deb.	100	978,000	6%	9 mo.	62.43	69.06
118½	116	231	80	503	310	235,800	2,317,900	Dupont de Nemours	20	10,482,000	4.00	9 mo.	5.64	5.97
178½	175	264¾	150	194½	163	71,700	1,031,700	Eastman Kodak	No	2,223,000	5.00	1928	9.60	9.61
126	126	128	117	132½	123½	290	3,640	pfd	100	61,657	6%	1928	326.17	326.68
190	100	310	170	230	120	1,200	9,600	Fed. Mining & Smelting	100	50,400	...	6 mo.	25.61	24.15
...	...	94½	42½	109½	43	78,200	998,700	Freeport Texas	No	729,844	4.00	9 mo.	3.76	4.49
50½	49½	...	...	94½	141½	74,600	1,135,200	General Asphalt	100	238,000	...	6 mo.	1.41	2.79
...	...	138	104½	150	132		44,200	pfd			5%	6 mo.	d6.97	13.89
33	32	64½	26	37	20⅜	11,400	1,518,400	Glidden Com.	No	676,000	2.00	9 mo.	2.79	3.55
101½	101½	106½	95	105	95	440	10,170	prior pfd	100	74,000	7%	9 mo.	26.46	32.69
40⅜	38½	82	31½	143½	71	431,900	6,299,300	Gold Dust	No	1,764,000	2.50	1928	1.33	0.82
...	...	...	...	380	192		4,470	Hercules Powder	No	566,000	3.00	9 mo.	4.41	22.04
...	...	...	...	125	118½		1,280	pfd	100	114,241	7%	9 mo.	28.33	35.35
52½	52½	79½	40	84	64½	8,900	181,200	Household Prod.	No	575,000	3.50	6 mo.	2.64	5.22
4⅜	4⅜	17¼	4	20⅜	13	19,200	221,000	Intern. Agri.	No	444,000			0.79	1.66
55	55	88½	40	85	48⅜	3,500	27,400	pfd	100	100,000	7%		10.54	14.47
32¾	31½	72½	25	46	41½	686,200	16,071,600	Intern. Nickel	No	13,777,000	1.00	6 mo.	0.75	1.05
48	48	68⅜	40	60	47⅜	4,400	163,300	Int. Print Ink	No	273,000	2.50	6 mo.	3.55	2.96
69	68	90	55½	69	49⅜	640	76,140	Intern. Salt	100	60,771	...	6 mo.	3.80	7.23
121½	121½	123	118	202	96⅜	278,100	3,509,500	Johns-Manaville	No	750,000	3.00	9 mo.	6.84	6.75
56⅜	54½	113⅞	40½	124½	63½	24,900	754,600	Liquid Carbonic Corp.	No	311,000	4.00	8 mo.	2.51	8.11
34	32	46	30	57½	45	6,500	74,000	Mac and Forbes	No	384,000	2.60	6 mo.	1.46	3.30
53½	51½	72⅜	29	190	117½	71,000	968,880	Mathieson Alk	No	637,000	2.00	9 mo.	2.67	4.35
...	122	125	120	130	115	40	3,570	pfd	100	28,000	7%	9 mo.	60.95	84.50
28	27½	54½	20	33	17⅜	36,500	1,758,300	Miami Copper	5	747,116	4.00	1928	1.96	1.53
49	47½	80½	47	...	...		5,025	Monsanto Chem.	No	316,975	1.25	6 mo.	5.13	7.52
29	30	58	15	58½	29½	21,100	1,042,500	National Dist. Prod.	No	168,000	...	6 mo.	2.99	...
31	30½	110⅜	67½	...	...		243,900	pfd. tem. ctfs.	...	...	...			...
138	138	210	129½	136	115	7,700	271,840	National Lead	100	309,831	5%	1928	11.45	8.40
...	50	103	43	...	...	1,400	161,600	Newport Co.	50	130,000	3.00	6 mo.	5.47	5.55
29	28	60⅞	22	41½	22⅜	31,800	730,200	Penick & Ford	No	433,773	...	9 mo.	2.96	3.15
240	220	404	208	217	107	12,700	195,400	Peoples Gas Chi.	100	566,000	8%		11.67	11.92
21⅜	21⅜	45	20	9⅜	6½	9,100	2,278,900	Spencer Kellogg	No	500,000	1.60		3.59	2.37
49½	48⅛	94	38½	71½	37	69,500	721,800	St Joseph Lead	10	1,952,000	2.00	6 mo.	2.22	2.96
66½	65	83	48	59⅜	37⅜	775,600	14,184,700	Standard Oil Co. of N. J.	25	24,835,000	1.00	1928	4.43	1.52
33⅜	32⅜	48⅛	31⅜	45½	28⅜	308,900	7,268,700	Standard Oil Co. of N. Y.	25	17,379,790	1.60	1928	2.28	0.67
13⅜	13	20⅞	9½	19¼	10¼	35,800	1,141,600	Tenn. Cop. & Chem.	No	857,000	1.00	1928	1.48	0.51
55	53⅜	85½	42½	82½	62¼	163,100	4,188,000	Texas Gulf Sulfur	No	2,540,000	4.00	9 mo.	4.52	5.72
79½	77½	140	59	209	186½	500,800	6,461,500	Union Carbide	No	9,200,000	2.40	9 mo.	2.89	3.71
137⅜	135⅛	243⅜	95	138	102½	261,200	2,274,500	U. S. Ind. Alc.	No	373,000	6.00	6 mo.	5.30	10.29
...	...	...	...	125⅞	118½		860	pfd	100	60,000				36.03
51⅜	49½	116½	37½	111½	60	83,400	1,935,200	Vanadium Corp.	No	378,000	3.00	6 mo.	3.13	4.53
5½	5½	24½	3½	20½	12	18,000	660,800	Virginia Car. com.	No	479,000	...			0.69
28½	27½	65½	15	64½	44⅜	7,800	166,220	6% pfd	100	213,392	...		3.06	d7.57
77½	77½	97½	69	99⅛	88½	2,210	29,720	7% pfd	100	144,000	7%		12.35	d20.09
								NEW YORK CURB						
9	8½	23	6	31½	16½	2,800	42,200	Acetol Prod.	No	60,000		1928	2.27	
24⅞	24	43½	15	42⅜	33¼	9,300	61,100	Agfa Ansco	No	300,000	...			
299	200	539½	146	197½	120	7,100	113,250	Aluminum Co. of America	No	1,472,625	...	1928	8.03	5.00
...	...	110	103	110½	104	6,600	40,500	pfd	100	1,472,625	6%	1928	14.04	10.26
28	26⅜	69½	20½	65	30⅜	252,200	2,319,175	Amer. Cyan.	No	66,000	1.60		1.56	†3.68
...	...	40⅜	40⅜	28½	11⅜	3,700	176,900	Amer. Sol. & Chem. com.	No	160,000	...	1928	1.69	0.07
...	...	42½	25⅛	47⅞	25½	4,700	89,500	pfd	No	113,000	...			
18⅜	18⅜	45⅜	15	54	26⅜	8,400	193,900	Anglo Chile Nitrate	No	1,756,750	...			...
...	...	10⅜	3⅜	33¾	7	6,200	153,100	Br. Celanese	108	2,200,000	...			...
...	...	...	...	46½	41		1,400	Canad. Ind. Alc.	No	969,000	1.52	1928	†2.87	†2.49
34	33⅜	57½	20	103	36½	12,400	156,800	Celanese Corp. of Am.	No	1,000,000	...	1928	0.67	1.72
13½	13½	50	12	122	34	8,700	18,700	Celluloid Co.	No	194,952	...	1928	1.29	0.86
51½	51	90	40	92	75	10,100	134,100	Colgate-Palmolive Peet		2,000,000	2.00	1928	2.65	2.10
12½	12½	25½	12	...	...		52,100	Courtaulds	£1	24,000,000		1928	19.88%	34.88%
...	...	...	...	24⅜	20		600	Am. dep. rects.	...	..	..			..

1929 Dec. 31 High	1929 Dec. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Dce.	Sales During 1929	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1929-1928		1927
								CLEVELAND						
...	...	...	...	23	7½		18,800	Heyden Chem.	10	150,000	...	1928	2.02	1.02
...	...	...	...	...	...	800	5,800	Imperial Chem. Ind.	£1	3,364,000		1928	26.70%	25.36%
...	...	27	13½	98	38½	300	2,500	Monroe Chem.	No	100,000	1.50	6 mo.	0.98	
...	...	...	...	...	...		700	Penn Salt	50	150,000	5.00	1928	8.27	8.09
...	...	10⅜	6⅛	9⅜	6½	100	56,000	Pyrene Mfg.	10	219,470	.80	1928	1.00	0.70
...	...	...	...	...	...	75	7,550	Sherwin Williams	25	594,445	4.00		6.99	6.42
17⅞	17½	48½	14½	111½	103	18,400	567,700	Silica Gel	No	600,000	...			
...	...	5½	1½	92	65½	3,200	5,800	Snia Viscosa	200 lire	8,333,333	...	1928	7.22%	2.01%
...	...	...	...	29	17	1,800	1,900	dep-receipts	...	...	...			...
...	...	149⅞	121½	10	5⅞	3,700	51,550	Swift & Co.	100	1,500,000	8%	1928	9.29	8.13
140	129	550	111	42	31½	2,635	30,755	Tubize "B"	No	78,858	10.00			
32	29⅛	61½	25½	150½	125	4,000	98,800	United Chem., pfd.	50	120,000	3.00			
...	...	...	...	630	450	600	152,440	com.	No	102,000				
40	40	91⅛	36⅛	100	53⅛	7,150	291,990	U. S. Gypsum	20	760,000	1.60	6 mo.	2.69	7.21
...	...	...	...	...	...		21,550	Westvaco Chlorine Prod.	No	200,000	2.00		3.60	
								CLEVELAND						
...	...	98¼	92	147½	104	240	24,746	Cleve-Cliff Iron	No	400,000	4.00			9.74
.70	70	80	60	225	112½	682	3,200	Dow Chem.	No	1,000,000	6.00			
...	...	...	...	107	103⅛	5	1,115	pfd.	100	30,000	7%			
...	...	...	...	...	...			Glidden	No	500,000	2.00		3.37	2.88
...	...	...	...	104½	96	100	2,965	prior pfd	100	69,167	7%	9 mo.	26.46	32.69
...	...	105	75	95	65½	549	21,413	Sherwin Williams	25	594,445	3.00	1928	6.99	6.42
...	...	108	103	109½	106	178	7,034	pfd.	100	125,000	6%		39.21	37.82
...	...	...	...	28	24⅛	10	2,957	Wood Chemical Prod. "A"	No	20,000	2.00			7.75
								CHICAGO						
...	...	26½	12	96	91½	800	23,250	Monroe Chem.	100	100,000	1.50	6 mo.	0.98	0.76
...	...	...	...	146	127½		7,572	Monsanto Chem.	No	311,000	1.25	6 mo.	5.13	7.52
136⅞	134½	145	123	...	..	13,100	108,950	Swift & Co.	100	1,500,000	8%	1928	9.87	8.13
41	39½	92½	35	...	...	32,450	503,950	U. S. Gypsum	20	812,000	1.60	6 mo.	2.69	7.21
				100	55			United Chemicals, pfd.	No	120,000	3.00		1.57	
								CINCINNATI						
55½	55¼	100	44¼	300	249	11,352	21,954	Proc. & Gam.	20	1,250,000	8.00		11.96	11.38
								PHILADELPHIA						
...	...	...	...	109½	92	1,100	42,700	Penn. Salt	50	150,000	5.00		10.64	8.27
33⅛	32½	59⅜	26	173½	114½	151,300	3,720,328	United Gas Imp.	No	3,999,000	1.00	1928	1.36	0.67
								MONTREAL						
...	...	...	...	...	...	2,465	43,538	Asbestos Corp.	No	200,000	...			0.87
12	12	...	...	...	...	491	12,401	pfd.	100	75,000	7%	1928	3.36	9.32
12½	11½	...	...	...	...	7,881	258,028	Canada Ind. Alc.	No	969,000	1.52	1928	†2.87	†2.49
78½	78	...	...	...	...	22,756	723,049	Shawinigan W. & P.	No	2,178,000	2.00	1928	2.17	2.41
								BALTIMORE						
...	...	...	...	28¼	17	1,000	2,000	Silica Gel	No	630,000	...			
								UNLISTED						
...	...	...	...	80	70			Agfa Ansco, pfd.	100	50,500	...			...
...	...	...	...	375	190			Hercules Powd., com.	No	147,000	14%		mo. 15.10	16.36
70	65	...	...	82	64			Merck. & Co., pfd.	100	33,950	...			...

The Industry's Bonds

1929 Dec. 31 High	1929 Dec. 31 Low	1929 High	1929 Low	1928 High	1928 Low	Sales In Dec.	Sales During 1929	ISSUE	Date Due	Int. %	Int. Period	Orig. (1) Offering $
								NEW YORK STOCK EXCHANGE				
103½	103½	106½	103	106⅜	104	114	1,228	Am. Agri Chem.	1941	7½	F. A.	30,00
96	96	99½	93½	97	92	29	1,424	Amer. Cyanid	1942	5	A. O.	
102½	102½	135	95	...	...	450	5,507	Amer. I. G. Chem.				
101	100½	102½	98	102⅜	99½	1,073	49,090	Am. Smelt & Refin "A" 5%	1947	5	A. O.	...
...	...	100	79	105½	92	20	2,889	Anglo Chilean	1945	7	M. N.	16,500
100½	100	103½	99½	103⅜	99⅛	1,020	2,418	Atlantic Refin.	1937	5	J. J.	15,000
103½	103½	103	98½	103⅛	100	73	438	By product Coke	1945	5½	M. N.	8,000
...	...	103	96½	103⅛	100	397	494	Corn Product Refin.	1934	5	M. N.	10,000
...	...	...	...	117	106	222	1,003	General Asphalt	1939	6	A. O.	5,000
...	...	95	90½	95⅛	89½	115	311	Int. Agric. Corp.	1932	5	M. N.	30,000
...	...	81½	72	86½	77	11	180	Int. Agri. Corp. stamped. extended	1942	5	M. N.	7,020
...	...	104	76	...	...	139	3,774	Lautaro Nitrate				
...	...	127	99	...	...	57	1,696	Montecatini	1937	7	J. J.	
...	...	99¼	93	...	...	60	1,809	Ex War	1937	7	J. J.	
...	...	113½	110	...	...		93	People's Gas & Coke	1943	6	A. O.	10,000
...	...	105¾	100½	108⅛	102	28	819	Refunding	1947	5	M. S.	40,000
102½	101	103½	100	104	102	3,187	9,208	Standard Oil N. J.	1946	5	F. A.	120,000
...	...	110	88	120	101⅛	318	1,406	Tenn. Cop. and Chem.	1941	6	A. O.	3,000
...	...	82	68⅞	91⅞	82	86	213	Va. Iron C. & C.	1949	5	M. S.	
								NEW YORK CURB				
102⅛	102⅛	103½	99½	103⅛	100	93	694	Alum. Co. of Am 52	1952	5	M. S.	
...	...	...	...	121⅛	98		2,354	Amer. Com. Alc.	1943	5	M. N.	
...	...	125	99	125	99	5	1,658	Amer. Solv. & Chem.	1936	6	M. S.	
96	95½	100½	93	101⅛	97⅛	226	3,049	Koppers Gas and Coke	1947	5	J. D.	25,000
...	...	...	...	103½	98		343	Natl. Dist. Prod.	1935	6½	J. D. 15	3,500
92	92	99¼	88½	98⅞	93½	119	1,693	Shawinigan W & P	1967	4½	A. O.	
...	...	...	...	106⅜	100	94	696	Silica Gel. 6½% with warr.	1952	6½		
...	...	...	...	100	95		2,616	Solvay Am. Invest. Corp.	1942	5	M. S.	15,00
100⅛	100⅛	102	98	101⅛	99⅛	535	1,234	Swift & Co.	1932	5	A. O.	50,00
...	...	104	98	104	99⅛	12	487	Westvaco Chlorine Prod.	1937	5½	M. S.	2,50

Russian Potash Production Reported Increasing Rapidly

Rapid progress is being made in the development of the Solikamsk potash deposits, located near the Upper Kama River, in the northwestern part of the Urals, according to the Economic Review of the Soviet Union. Two shafts are being sunk and are now about at the level of the first workable vein, at a depth of 120 meters.

"For the fiscal year 1929-30," the article adds, "the production is planned at 500,000 tons of potassium salts, which will be increased to 1,200,000-1,500,000 tons in the succeeding few years. A narrow-gauge railway, roads, machine shops, brick factory and other subsidiary structures have already been built. A German engineering firm is furnishing technical assistance on the development work.

Extensive researches carried on during the past few years indicate that the potash deposits in this district are probably the largest in the world. In the surveyed area (30 to 40 square kilometers) the content of pure potassium oxide has been found to average about 11,500,000 metric tons per square kilometer. This would give a total of about 350,000,000 to 450,000,000 tons of potash for the entire surveyed area, extracted from 1,750,000,000 to 2,250,000,000 tons of carnallite and sylvanite. By way of comparison it may be stated that these totals exceed the reserves of the Alsace deposits in an area of 172 square kilometers, estimated at 1,500,000,000 tons, with a potash content of about 300,000,000 tons. That is, the potash content per unit of area of the Soviet deposits is more than five times as large as that of the Alsace deposits. However, the Solikamsk deposits constitute only a part of the total resources of the region in which potassium salts have been found. Recent estimates of the Geological Survey put the resources of the region, covering an area of from 300 to 400 square kilometers, at not less than 4,000,000,000 tons of potassium salts. Another point of great importance is the fact that the workable Soviet deposits are located at depths of from only 95 to 200 meters, while the Stassfurt and Alsace deposits, which are now the principal sources of the world's potash supply, have to be extracted from a depth of 600 meters.

"Chemical analyses of the potassium salts of the Urals region show that they are of a superior quality, being higher in potassium content than either the Stassfurt or Alsace salts, while at the same time they are free of the detrimental magnesium salts found in the latter deposits. An average sample of Solikamsk carnallite showed a content of potassium chloride of 23.55 per cent., as compared with 16 per cent. for average Stassfurt carnallite and 19.5 per cent. for Alsace carnallite. The Solikamsk sample contained no kieserite, while the Stassfurt and French carnallites contained 12 per cent. and 9.3 per cent., respectively."

New potassium nitrate process operated by the Wintershall (potash) concern at its plant at Sondershausen utilizing its Claude synthesis ammonia from its Rauxel (Westphalian) plant is producing nearly 100 tons potassium nitrate daily. It also gets a by-product yield of ammonium chloride, a fertilizer. The process now used treats potassium chloride from Sonderhausen mines with nitric acid (made at Sonderhausen by oxidizing Rauxel ammonia), for a yield of potassium nitrate (crystals) and hydrochloric acid. The acid is then treated with ammonia yielding ammonium chloride which is concentrated and crystallized. The Sondershausen plant is being expanded and next year will begin production of potassium nitrate and ammonium phosphate by treating phosphate rock with nitric acid and potassium sulfate, reports the Department of Commerce.

Soda ash consumption in Belgium has increased about 500 per cent since 1913. Much of this increase has been caused by the expanding use of soda ash to replace Glauber's salt in the glass industry.

Nitrogen Production Outstrips Consumption in 1928-29 Report

British Sulfate of Ammonia Federation issues ninth annual report giving the world's nitrogen position for the year ending June 30, 1929. During the year under review, there was an increase of 389,000 tons or about 22½ per cent in the production of the forms of nitrogen enumerated below, Chilean nitrate contributing 100,000 tons and the other forms 287,000 tons ot this total. The total consumption increased by 230,000 tons or 14 per cent following on an increase of 330,000 tons or 25 percent in the previous season. The following figures are offered as fair estimates of the output of the various forms, but strict accuracy is not claimed for them. In the light of more recent information the figures for previous years have been slightly increased.

World Production and Consumption of Nitrogen in Metric Tons of Pure Nitrogen for the Fertilizer Years

Production	*1923/24*	*1926/27*	*1927/28*	*1928/29*
By-product sulfate of ammonia	264,600	328,200	368,000	376,000
Synthetic sulfate of ammonia	231,100	300,000	367,000	485,000
	495,700	628,200	735,000	861,000
Cyanamide*	104,000	180,000	204,000	210,000
Nitrate of lime	18,000	81,000	105,000	136,000
Other forms of synthetic nitrogen**	51,100	133,400	236,000	365,000
Other forms of by-product nitrogen**	50,200	42,300	54,000	51,000
Chilean nitrate of soda	338,500	199,600	390,000	490,000
Total production	1,057,500	1,264,500	1,724,000	2,113,000
Consumption				
Consumption of manufactured nitrogen	719,000	1,037,500	1,250,700	1,453,000
Consumption of Chilean nitrate of soda	340,000	275,200	391,300	419,000
Total consumption	1,059,000	1,312,700	1,642,000	1,872,000
Agricultural consumption about	934,000	1,200,000	1,490,000	1,684,000

*Excluding the bulk of the cyanamide made in Japan, which is included under synthetic sulfate of ammonia.
**Including ammonia liquor used for industrial purposes.

The report makes the following comments on these statistics: In view of the unsatisfactory economic position of farmers in many lands, the increase of 230,000 tons of nitrogen in the world's consumption during the year under review is regarded as satisfactory. Chilean nitrate secured about 12 per cent of this increase and the remaining 88 per cent fell to sulfate of ammonia and other forms of nitrogen. The most notable increases in consumption took place in the U. S. A., Northern Europe and the Japanese Empire. Selling prices during the year for synthetic forms of nitrogen were only slightly below the level of 1927-28, but there was a reduction of about 10 per cent for Chilean nitrate. For 1929-30 prices for all forms of nitrogen have been reduced by about 10 per cent. The significant feature observable in the nitrogen statistics for the year 1928-29 is the tendency for production to outrun consumption. For 1929-30 a further considerable increase in production is expected. The estimates vary from 250,000 to 400,000 tons of nitrogen. An increase of about 22 per cent in consumption is required to absorb the lower of these last two figures together with the stock carried forward from 1928-29. Concerted efforts will be required on the part of the many groups producing nitrogen if consumption is to be maintained at this high level.

"Fosfacid," Ein-und Verkaufsgesellschaft der chemischen Grossindustrie, Gesellschaft m.b.H. has recently been formed in Czecho-Slovakia with a capital of one million Czech crowns to act as a co-operative sales organization for the products of the country's fertilizer industries. Its activities will be divided into four main sections, the first three dealing with superphosphate, cyanamide and sulfuric acid respectively, and the fourth having the functions of an agricultural advisory and propaganda bureau. All the important Czecho-Slovakian producers have joined the new scheme.

The Trend of Prices

Production of Past Month Declines Below Level of Last Year

Chemical Business Declines Noticeably During Inventory Period—Favorable Feature Seen in Alkali Contracts Which Are From Three to Four Per Cent Ahead of Last Year—Considerable Keen Competition and Lower Prices Have Featured Past Month in Chlorine and Methanol Markets.

Production generally declined during the past month as well as in November and the level is now below that of last year. There has been a corresponding decrease in freight car loadings and wholesale prices are also lower.

Production in basic industries decreased by 9 per cent in November, according to the index of the Federal Reserve Board, and was 5 per cent lower than a year ago. The decline in production, which began in midsummer, was restricted prior to November largely to industries in which the expansion during the earlier part of the year had been exceptionally rapid, particularly iron and steel, automobiles, and related industries.

The same industries showed the largest reductions in November, but there were declines also in the copper, cotton and wool textiles, and shoe industries, and, in smaller degree, in silk textiles and coal. Production of crude petroleum was also curtailed. Volume of building contracts awarded during the month continued to be considerably smaller than in the corresponding period of 1928.

Employment in factories was also reduced during November to a level slightly below a year ago, and there was a somewhat larger decrease in factory pay rolls. The decline in employment since mid-summer, however, has been relatively smaller than that in the physical volume of production. Employment was in smaller volume than in November a year ago in the automobile, iron and steel, lumber, and rubber products industries, and larger in the machinery, textiles, paper and printing, leather, and chemical industries.

Distribution of commodities, as measured by freight-car loadings, was in smaller volume in November than in October, reflecting larger-than-seasonal decreases in most classes of freight. Miscellaneous freight in less-than-carload lots, however, which includes chiefly commodities for retail trade, showed the usual seasonal change.

Wholesale prices were at a lower level in November than in October and continued to decline during the first half of December. The downward movement, which had previously involved principally commodities with organized exchanges, became general during the latter part of the period.

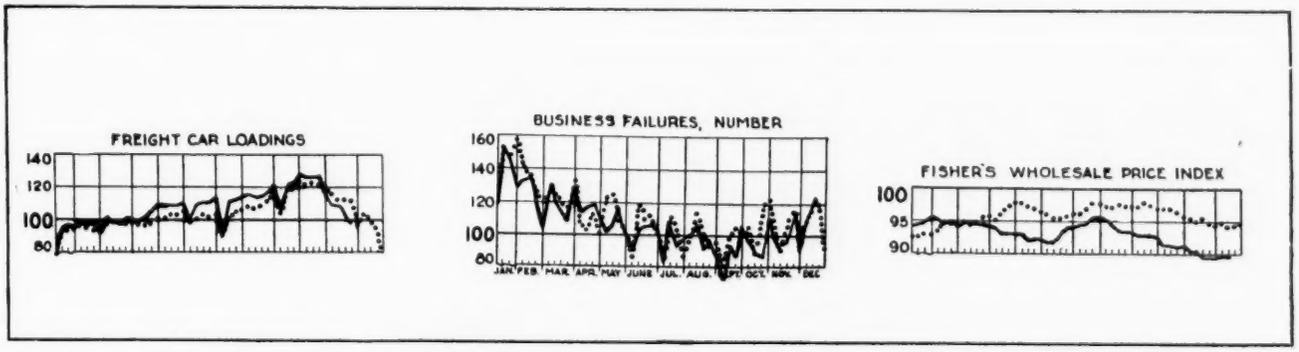
Liquidation of bank credit, which had begun early in November, continued throughout that month and the first two weeks of December, and on Dec. 11 total loans and investments of reporting member banks were at about the same level as on Oct. 23, prior to the increase caused by the withdrawal of funds by non-banking lenders.

Reserve bank credit outstanding was also reduced during November and the first two weeks of December, largely in consequence of reduction in balances of member banks at the reserve banks, which accompanied the liquidation of member bank credit. The decrease in reserve balances released reserve funds in more than sufficient volume to meet the export demand for gold amounting to $65,000,000 during the period, as well as the seasonal currency requirements.

Money rates in the open market continued to decline and the discount rate, which had previously been reduced at five reserve banks, was lowered at the Kansas City bank from 5 to 4½ per cent.

In the chemical industry, there has been a noticeable let down during the past month. An outstanding contributing feature, has of course been the inventory period with its accompanying reluctantness upon the part of buyers to carry over any stocks, and it is hoped that the first of the year will bring a revival of activity. It is very significant, however, that alkali contracts are from three to four per cent ahead of last year at this time. It has been pointed out before that the alkalis are an exceptionally fine indicator of the state of industry generally since they go into such a variety of industries in such large quantities.

Chlorine has been in a very unsettled situation. There is undoubtedly an overproduction which during the past month culminated in an unusually acute competitive situation bringing with it lower prices. The same condition exists in the methanol market and, too a lesser degree in the acetone market. There has been but little else of note, since the general tone of the month has been one of inactivity.



Business indicators prepared by the Department of Commerce. The weekly average 1923-35 inclusive = 100. The solid line represents 1929 and the dotted line 1928.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

Acetone — During the past month the market has continued to be slightly off with very little active demand in evidence. The automobile industry, especially has not as yet resumed consumption of this material in anything like normal quantities. However, it is thought that the turn of the year will bring with it improved conditions into this market since it is pointed out that consumers have little or no stocks on hand, which is, in itself, a very healthy condition.

Acid Acetic — Supplies of this material are much freer than they have been in some considerable time. Since this is the season for most heavy production of the raw material, calcium acetate is in better supply, and combined with this is the fact that demand for the acid, itself, has not been up to what had previously been considered normal, chiefly due to the fact that rayon production has been slightly off. In this market, too, it is true that only very light stocks are in the hands of consumers, so that with resumption of buying activity, producers will once more be pressed to capacity to satisfy demands.

Acid Boric — Consuming demand in this market has continued to be very satisfactory and the market generally is very firm since the move towards price stabilization made by producers something over a month ago. Export demand has been especially satisfactory and for the first ten months of this year, exports amounted to 2,454 tons, valued at $168, 821, as compared with 1,475 tons valued at $166,712 in the same period of 1928. According to these preliminary figures. the value per ton of boric acid imports declined from $113 to $69.

Acid Chromic —Continues to meet with good demand as a plating material. Consumption has been along broad lines, but due to the fact that there is considerable competition in this market, prices have not risen and remain at a rather low level.

Acid Citric — During the past month, buying has been very limited in nature. What little new business there has been, has been very restricted due largely to the fact that with the inventory period, consumers have been anxious to keep stocks as low as possible.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.26	.18½	.24	.24	Acetaldehyde, dr s lc-1 wks...lb.	.18½	.21	.21	.18½
				Acetaldol, 50 gal dr.....lb.	.27	.31	.31	.27
.24	.23	.20	.20	Acetanilid, tech, 150 lb bbl...lb.	.21	.23	.24	.21
.35	.29	.29	.29	Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.28	.29	.35	.28
.....	.....	.38	.32	Acetin, tech drums.....lb.	.30	.32	.32	.30
.15	.13	.12	.12	Acetone, ...lb.	.11	.13	.16	.11
1.75	1.65	1.65	1.65	Acetone Oil, bbls NY.....gal.	1.15	1.25	1.25	1.15
.45	.42	.42	.42	Acetyl Chloride, 100 lb cby...lb.	.55	.68	.68	.45
				Acetylene Tetrachloride (see tetrachlorethane).....				
				Acids				
				Acid Acetic, 28% 400 lb bbls				
3.88	3.38	3.38	3.38	c-1 wks.....100 lb.	.....	3.88	3.88	3.88
13.68	11.92	11.92	11.92	Glacial, bbl c-1 wk.....100 lb.	.....	13.68	13.68	13.68
1.00	.98	.98	.98	Anthranilic, refd, bbls.....lb.	.98	1.00	1.00	.98
.80	.80	.80	.80	Technical, bbls.....lb.	.....	.80	.80	.80
2.25	1.60	1.60	1.25	Battery, cbys.....100 lb.	1.60	2.25	2.25	1.60
.60	.57	.57	.57	Benzoic, tech, 100 lb bbls....lb.	.51	.53	.60	.51
.11	.08½	.08½	.08½	Boric, crys. powd, 250 lb bbls.....lb.	.06½	.07½	.07½	.05½
1.25	1.25	1.25	1.25	Broenner's, bbls.....lb.	.....	1.25	1.25	1.25
.90	.85	.85	.80	Butyric, 100% basis cbys.....lb.	.85	.90	.90	.85
4.85	4.85	4.90	4.85	Camphoric.....lb.	.....	5.25	5.25	4.85
.16	.15	.15	.15	Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.05½	.04½
.30	.25	.37	.25	Chromic, 99%, drs extra.....lb.	.17½	.19	.23	.17½
1.06	1.00	1.00	1.00	Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.06	1.00
.44½	.59	.44½	.43	Citric, USP, crystals, 230 lb bbls.....lb.	.46	.59	.70	.46
.97	.95	.95	.95	Cleve's, 250 lb bbls.....lb.	.52	.54	.59	.52
.70	.68	.60	.57	Cresylic, 95%, dark drs NY..gal.	.60	.70	.54	.60
.72	.72	.70	.60	97-99%, pale drs NY.....gal.	.72	.77	.77	.72
.12	.11	.11	.10	Formic, tech 90%, 140 lb cby.....lb.	.10½	.12	.12	.10½
.55	.50	.50	.50	Gallic, tech, bbls.....lb.	.50	.55	.12	.50
.74	.74	.74	.69	USP, bbls.....lb.	.....	.74	.55	.74
1.06	1.00	1.00	1.00	Gamma, 225 lb bbls wks.....lb.	.77	.80	.80	.74
.63	.57	.57	.57	H, 225 lb bbls wks.....lb.	.65	.70	.99	.80
.67	.67	.67	.65	Hydriodic, USP, 10% soln cby lb.	.....	.67	.72	.67
.48	.45	.45	.45	Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.67 .48	.45
				Hydrochloric, CP, see Acid Muriatic.....			.....	.....
.90	.80	.80	.80	Hydrocyanic, cylinders wks...lb.	.80	.90	.90	.80
.06	.06	.06	.06	Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06
.11	.11	.11	.11	Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	.....	.11	.11	.11
.85	.85	.85	.85	Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85	.85
.06	.04½	.05½	.05½	Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.05½	.04½
.13½	.12	.13	.13	44%, light, 500 lb bbls.....lb.	.11	.11½	.12½	.11
.54	.52	.52	.52	Laurent's, 250 lb bbls.....lb.	.40	.42	.42	.40
.60	.48	.....	.....	Malic, powd., kegs.....lb.	.48	.60	.60	.48
.65	.60	.60	.60	Metanilic, 250 lb bbls.....lb.	.60	.65	.65	.60
.08	.07½	.07½	.07½	Mixed Sulfuric-Nitric..... tanks wks.....N unit	.07	.07½	.07½	.07
.01½	.01	.01	.01	tanks wks.....S unit	.008	.01	.01	.008
.21	.18	.21	.18	Monochloroacetic, tech bbl..lb.	.18	.21	.21	.18
.65	.65	1.65	1.65	Monosulfonic, bbls.....lb.	1.65	1.70	1.70	1.65
1.40	1.35	1.35	1.35	Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.40	1.35
				tanks, wks. 100 lb.		1.00	1.00	1.00
1.80	1.70	1.70	1.70	20 degrees, cbys wks...100 lb.	.....	1.45	....	1.45
.95	.85	.95	.95	N & W, 250 lb bbls.....	.85	.95	.95	.85
.59	.55	.55	.55	Naphthionic, tech, 250 lb.....	.....	Nom.	.59	.55
5.00	5.00	5.00	5.00	Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00
6 00	6.00	6.00	6.00	40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00	6.00
.11½	.10½	.11½	.11	Oxalic, 300 lb bbls wks NY...lb.	.11½	.11½	.11½	.11
.08½	.08	.08	.07	Phosphoric 50%, U. S. P.....lb.	.....	.14	.14	.08
.16	.16	.19	.16	Syrupy, USP, 70 lb drs....lb.	.....	.14	.16	.14
.50	.50	.50	.50	Picramic, 300 lb bbls.....lb.	.65	.70	.70	.65
.50	.40	.45	.30	Picric, kegs.....lb.	.30	.50	.50	.30
.86	.86	.86	.86	Pyrogalic, crystals..... .....lb.	1.30	1.40	1.40	.86
.32	.27	.27	.27	Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.42	.33
.16	.15	.15	.15	Sulfanilic, 250 lb bbls.....lb.	.15	.16	.16	.15
1.95	1.60	1.60	1.60	Sulfuric, 66 deg, 180 lb cbys lc-1 wks.....100 lb.	1.60	1.95	1.95	1.60
				tanks, wks. ton		15.50	15.50	15.50
1.37½	1.20	1.20	1.20	1500 lb dr wks.....100 lb.	1.50	1.65	1.65	1.50
1.12½	1.12½	1.10	1.10	60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.42½	1.27½
18.50	18.50	18.50	18.50	Oleum, 20%, 1500 lb. drs lc-1 wks .....ton	.....	18 50	18.50	18.50
42 00	42.00	42.00	42.00	40%, lc-1 wks net .....ton	.....	42.00	42.00	42.00

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(ETHYLENE GLYCOL MONOETHYL ETHER). A colorless, practically odorless liquid boiling at 134.8°C largely used in the manufacture of nitrocellulose lacquers. An excellent solvent for dyes, particularly of the Indigosol type, and therefore used in the textile industry for printing and vat dyeing.

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(ETHYLENE GLYCOL MONOBUTYL ETHER). An excellent "high-boiling" (170.6°C) lacquer solvent having particularly good compatibility for gums and resins. Also useful as a spotting compound and solvent in the dry cleaning trade.

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(DIETHYLENE GLYCOL MONOETHYL ETHER). An excellent solvent for dyes, nitrocellulose and resins, boiling at 198°C. It is used in the manufacture of safety glass, in dye printing and textile soaps.

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(DIETHYLENE GLYCOL MONOBUTYL ETHER). A solvent with a boiling point (222°C) which approaches that of a plasticizer. It is used in baking lacquers, pyroxylin dopes and other plastics. Also used as a solvent for dyes.

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

Acid Lactic — Supplies have been moving out steadily under contract requirements, and demand for all grades continues very good.

Acid Muriatic — In common with the other mineral acids the market on this material continues firm, with the volume of business reaching satisfactory totals for this season of the year.

Acid Nitric — Business has rather slowed up in this market during the past month due chiefly to the fact that, faced with the inventory period, buyers were curtailing their demands to minimum quantities. Prices are generally firm.

Acid Oxalic — Conditions in this market have been about normal during the past month with shipments moving in fairly good shape considering the curtailment in various other lines.

Acid Sulfuric — Contract demand has continued to be practically normal for this season of the year although generally speaking the past month has been a rather quiet one. An interesting development has been a steadily increasing demand from fertilizer manufacturers, which is expected to expand considerably.

Alcohol — A comfortable movement of this material into consuming channels is reported for the past month. This, of course, has all been against old contracts, and now the industry faces the new year on a new price basis. Quotations are at 51c gal. on C. D. Number 1 in drums, while C. D. Number 5, is at 48c gal. in tanks and 50c gal. in drums. Based upon molasses prices it is said that these prices should be considerably higher and that alcohol should sell about 7c to 8c gallon above the present price level. However, despite the increased raw material costs, prices for the coming year do not average any higher than those of the year just past, since all efforts are being directed towards stimulating increased industrial uses, and it is realized that low prices are best for achieving this result. In so far as the present situation is concerned, inventories are once more assuming very comfortable proportions so that the advent of colder weather is being looked forward to. The situation is not as yet comparable to that which existed before the cold spell of about December 1, but it could easily become more serious unless the weather soon becomes more seasonable for this period of the year. Butyl alcohol continues in about the same position as reported here last month, due to the fact that up to the turn of the year the automobile industry had not as yet resumed activity. Total imports of 22,610 pounds of phenyl ethyl alcohol entered for consumption during the first ten months of 1929 registered an increase of nearly 22

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.40	.30	.30	.30	Tannic, tech, 300 lb bbls..lb.	.30	.40	.40	.30
.38	.34½	.37	.29½	Tartaric, USP, crys, powd, 300 lb. bbls.....lb.	.38	.38½	.38½	.38
.85	.85	.85	.85	Tobias, 250 lb bbls .....lb.	.....	.85	.85	.85
2.75	2.75	2.75	2.00	Trichloroacetic bottles.....lb.	.....	2.75	2.75	2.75
2.00	2.00	2.00	2.00	Kegs.....lb.	.....	2.00	2.00	2.00
1.25	1.00	1.00	1.00	Tungstic, bbls.....lb.	1.40	1.70	2.25	1.00
.55	.43	.45	.45	Albumen, blood, 225 lb bbls..lb.	.38	.40	.47	.38
				dark,.....bbls., lb.	.12	.20	.20	.12
.84	.78	.95	.80	Egg, edible.....lb.	.74	.77	.83	.70
.80	.70	.92	.77	Technical, 200 lb cases ..lb.	.70	.75	.80	.70
.65	.60	.60	.60	Vegetable, edible.....lb.	.60	65	.65	.60
.55	.50	.50	.50	Technical.....lb.	.50	.55	.55	.50
				Alcohol				
.20	.18½	.20	.19	Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	.17½	.18½	.17½	.17½
.19½	.18½	.20½	.19½	Drums, 1-c-1 wks.....lb.	.17½	.18½	.18½	.17½
.19	.17½	.19½	.18½	Tank cars wks.....lb.	.16½	.17½	.17½	.16½
2.25	1.75	.....	.....	Amyl (from pentane) drs c-1 wks.....gal.	.....	1.67	1.67	1.67
1.80	1.70	1.70	1.70	Diacetone, 50 gal drs del..gal.	1.42	1.60	1.80	1.42
3.70	2.65	3.70	3.70	Ethyl, USP, 190 pf, 50 gal bbls.....gal.	2.66	2.75	2.75	2.69½
.55	.50	.50	.50	Anhydrous, drums.....gal.	.....	.71	.71	.71
.52	.48½	.52	.37½	Completely denatured, No. 1, 190. pf, 50 gal drs drums extra.....gal.	.....	.51	.52	.49
.50	.43	.50	.29	No. 5, 188 pf, 50 gal drs. drums extra.....gal.	.....	.50	.51	.48
.46	.41	.46	.25	Tank, cars.....gal.	.....	.48	.50	.46
1.25	1.00	1.00	1.00	Isopropyl, ref, gal drs.....gal.	1.05	1.30	1.30	1.00
1.00	1.00	1.00	1.00	Propyl Normal, 50 gal dr..gal.	.....	1.00	1.00	1.00
.82	.80	.80	.80	Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.82	.80
.65	.65	.65	65	Alpha-Naphthol, crude, 300 lb bbls.....lb.	.....	.65	.65	.65
.37	.35	.35	.35	Alpha-Naphthylamine, 350 lb bbls.....lb.	.32	.34	.34	.32
3.30	3.25	3.25	3.15	Alum Ammonia, lump, 400 lb bbls, lc-1 wks.....100 lb.	3.30	3.50	3.50	3.25
5.50	5.25	5.25	5.25	Chrome, 500 lb casks, wks .....100 lb.	5.00	5.25	5.50	5.00
3.20	3.10	3.50	3.10	Potash, lump, 400 lb casks wks.....100 lb.	3.20	3.50	3.50	3.00
3.75	3.75	3.75	3.75	Soda, ground, 400 lb bbls wks.....100 lb.	.....	3.75	3.75	3.75
26.00	24.30	27.00	26.00	Aluminum Metal, c-1 NY.100 lb.	.....	24.30	24.30	24.30
.40	.35	.35	.35	Chloride Anhydrous,.....lb.	.05	.15	.20	.05
.18	.17	.17	.17	Hydrate, 96%, light, 90 lb bbls.....lb.	.17	.18	.18	.17
.24	.18	.23	.23	Stearate, 100 lb bbls.....lb.	.25	.26	.26	.25
1.75	1.75	1.75	1.75	Sulfate, Iron, free, bags c-1 wks.....100 lb.	1.95	2.05	2.05	1.95
1.40	1.40	1.40	1.35	Coml, bags c-1 wks..100 lb.	.....	1.40	1.40	1.40
1.15	1.15	1.15	1.15	Aminoazobenzene, 110 lb kegs lb.	.....	1.15	1.15	1.15
				Ammonium				
.14	.13½	.13½	.10	Ammonia, anhyd, 100 lb cyl..lb.	.15½	.15½	.14½	.14
.03	.03	.03	.02½	Water, 26°, 800 lb dr del..lb.	.....	.03½	.03½	.03½
				Bicarbonate, bbls., f.o.b. plant .....100 lb.	.....	5.15	6.50	5.15
.22	.21	.21	.21	Bifluoride, 300 lb bbls.....lb.	.21	.22	.22	.21
.09	.08½	.08½	.08½	Carbonate, tech, 500 lb cs..lb.	.09	.12	.12	.09
5.15	4.45	5.05	4.85	Chloride, white, 100 lb. bbls wks.....100 lb.	4.45	5.15	5.15	4.45
5.75	5.25	.07	.05½	Gray, 250 lb bbls wks....lb.	5.25	5.75	5.75	5.25
.11½	.11	.11	.11	Lump, 500 lb cks spot...lb.	.11	.11½	.11½	.11
.16	.15	.15	.15	Lactate, 500 lb bbls.....lb.	.15	.16	.16	.15
.10	.06	.06	.06	Nitrate, tech, casks.....lb.	.06	.10	.10	.06
.38	.27½	.27½	.27½	Persulfate, 112 lb kegs.....lb.	.26	.30	.34	.26
.18	.18	.18	.18	Phosphate, tech, powd, 325 lb bbls.....lb.	.12½	.13	.13	.12½
2.90	2.20	2.30	2.55	Sulfate, bulk c-1.....100 lb.	2.10	2.20	2.40	2.05
3.00	2.50	2.55	2.35	Southern points.....100 lb.	2.10	2.20	2.45	2.05
60.85	60.85	59.70	56.85	Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f.....ton	.....	55.85	60.85	52.40
.60	.55	.55	.55	Sulfocyanide, kegs.....lb.	.36	.48	.48	.36
2.25	1.72	2.25	1.90	Amyl Acetate, (from pentane) drs.....gal.	1.60	1.70	1.70	1.60
.....	.....	.....	.....	Tech., drs.....lb.	.23	.24	.24	.23
				Alcohol, see Fusel Oil.....				
				Furoate, 1 lb tins.....lb.		5.00		
.16½	.15½	.15½	.15	Aniline Oil, 960 lb drs.....lb.	.15	.16	.16½	.15
.48	.41	.41	.41	Annatto, fine.....lb.	.34	.37	.37	.34
1.00	.90	.90	.90	Anthraquinone, sublimed, 125 lb bbls.....lb.	.80	.90	.90	.80
.12	.09½	.11½	.14	Antimony, metal slabs, ton lots .....lb.	.....	.08½	.10	.08½
.12	.10	.15½	.14	Needle, powd, 100 lb cs....lb.	.....	.10	.10	.09
.18	.17	.17	.17	Chloride, soln (butter of) cbys.....lb.	.13	.17	.18	.13
.12	.09½	.16½	.16½	Oxide, 500 lb bbls.....lb.	.....	.08½	.10	.08½
.....	.....	.28	.25½	Salt, 66%, tins.....lb.	.....	.24	.26	.24
.20	.16	.20	.16	Sulfuret, golden, bbls.....lb.	.16	.20	.20	.16
.42	.38	.42	.37½	Vermilion, bbls.....lb.	.38	.42	.42	.38
.19	.17	.18	.18	Archil, conc, 600 lb bbls.....lb.	.17	.19	.19	.17
.14	.12	.12	.12	Double, 600 lb bbls.....lb.	.12	.14	.14	.12
.16	.15	.16	.14	Triple, 600 lb bbls.....lb.	.12	.14	.16	.12
.16	.15	.15	.12½	Argols, 80%, casks.....lb.	.....	.18½	.18½	.18½
.08	.08	.08	.03	Crude, 30%, casks.....lb.	.08	.08	.08	.08
.11	.10½	.10½	.10½	Arsenic, Red, 224 lb kegs, cs..lb.	.09	.11	.11	.09
.04	.03½	.04	.03½	White, 112 lb kegs.....lb.	.04	.04½	.04½	.04
14.75	14.75	14.75	14.75	Asbestine, c-1 wks.....ton	.....	15.00	15.00	4.75

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

per cent over imports during the corresponding period of 1928 when 18,560 pounds were entered. This increase may be attributed, to a great extent, to much larger imports during the last two months of the 1929 period, as compared with imports in the same months of 1928.

Ammonia — Contracts have been coming in rather more slowly than last year according to reports. However, the market is in very strong position, and as of the first of the year, prices on anhydrous were increased 1½c lb. It is likely that prices on aqua will remain unchanged although it is said that there is some likelihood of these quotations also going higher later on in the year in order that these prices may be more consistent with those on anhydrous. By the first of the year practically all of the larger buyers had signed contracts for their requirements but quite a few of the smaller buyers had not as yet committed themselves.

Ammonium Chloride — Sales of this material are falling off decidedly and new uses are being investigated with a view to replacing to some extent that which is gradually being lost due to the electrified radio. Consumers other than battery makers, show slight increases, but the bulk of the business is falling off.

Ammonium Sulfate — During the past month the market has continued easy with little or no business in evidence. Buying interest has been at a stand still and concessions reported on all sides although quotations continue unchanged at $2.10 @ $2.20. It is expected, however, that business will show renewed activity after the first of the year.

Antimony — Dullness has prevailed during practically the entire month and there seems to be no immediate sign of any recovery in this market. Stocks are well maintained and although offerings are light, consumers also show no interest.

Arsenic — White has been in good demand from manufacturers of insecticides. No change is indicated in the market and competitive conditions as regards foreign material continue unchanged.

Beeswax — A slightly weaker tendency developed in this market during the closing days of the month and quotations on refined fell to 38c lb.

Bleaching Powder — The bulk of the contracts on the new year are reported to have been closed and the market generally is reported to be in healthy condition. October exports of this material amounted to 293,587 pounds, valued at $8,692, the largest quantities going to Argentina, Cuba, Canada, Brazil and the Philippine Islands, in order named.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Barium			
57.00	47.00	47.50	47.50	Barium, Carbonate, 200 lb bags wks.....ton	58.00	60.00	60.00	57.00
.12½	.12	.12	.12	Chlorate, 112 lb kegs NY..lb.	.14	.15	.15	.14
65.00	54.00	65.00	57.50	Chloride, 600 lb bbl wks...ton	63.00	69.00	69.00	63.00
.13½	.13	.13	.13	Dioxide, 88%, 690 lb drs...lb.	.12	.13	.13	.12
.04½	.04½	.04½	.04½	Hydrate, 500 lb bbls.....lb.	.04½	.05½	.05½	.04½
.08	.07½	.07½	.07½	Nitrate, 700 lb casks.....lb.	.08	.08½	.08½	.08
24.00	23.00	23.00	23.00	Barytes, Floated, 350 lb bbls wks.....ton	23.00	24.00	24.00	23.00
8.00	5.00	.....	.....	Bauxite, bulk, mines.....ton	5.00	8.00	8.00	5.00
.38	.36	.40	.37	Beeswax, Yellow, crude bags..lb.	.....	.34	.37	.34
.43	.41	.46	.38	Refined, cases.....lb.	.....	.39	.42	.39
.58	.56	.58	.56	White, cases.....lb.	.51	.53	.53	.51
.70	.65	.65	.65	Benzaldehyde, technical, 945 lb drums wks.....lb.	.60	.65	.65	.60
				Benzene			
.23	.21	.23	.21	Benzene, 90%, Industrial, 8000 gal tanks wks.....gal.	.....	.23	.23	.23
.23	.21	.23	.21	Ind. Pure, tanks works....gal.	.....	.23	.23	.23
.74	.70	.70	.70	Benzidine Base, dry, 250 lb bbls.....lb.	.70	.74	.74	.70
1.00	1.00	1.00	1.00	Benzoyl, Chloride, 500 lb drs.lb.	.....	1.00	1.00	1.00
.25	.25	.....	.....	Benzyl, Chloride, tech drs....lb.	.....	.25	.25	.25
.26	.24	.24	.24	Beta-Naphthol, 250 lb bbl wk.lb.	.22	.24	.26	.22
1.35	1.35	1.35	1.35	Naphthylamine, sublimed, 200 lb bbls.....lb.	.....	1.35	1.35	1.35
.65	.63	.63	.63	Tech, 200 lb bbls.....lb.	.60	.65	.68	.60
90.00	80.00	80.00	80.00	Blanc Fixe, 400 lb bbls wks..ton	75.00	90.00	90.00	75.00
				Bleaching Powder			
2.25	2.25	2.25	2.00	Bleaching Powder, 300 lb drs c-1 wks contract.....100 lb.	2.00	2.35	2.25	2.00
5.25	4.65	3.75	4.75	Blood, Dried, fob, NY.....Unit	.....	3.90	4.60	3.90
5.35	4.75	.....	.....	Chicago.....Unit	.....	4.50	5.00	4.40
5.05	4.50	.....	.....	S. American shipt.....Unit	.....	4.25	4.70	4.25
.35	.31	.30	.28	Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.....	.35	.35	.32
30.00	29.00	38.00	29.00	Bone, raw, Chicago.....ton	.....	39.00	42.00	39.00
.07	.06	.06	.06	Bone, Ash, 100 lb kegs.....lb.	.06	.07	.07	.06
.08½	.08½	.08½	.08½	Black, 200 lb bbls.....lb.	.....	.08½	.08½	.08½
37.00	31.00	30.00	28.00	Meal, 3% & 50%, Imp....ton	.....	31.00	35.00	30.00
.05	.2½	.04½	.04½	Borax, bags.....lb.	.02½	.03½	.03½	.02½
.12	.10½	.11	.11	Bordeaux, Mixture, 16% pwd..lb.	.12	.14	.14	.10½
.10	.08	.08	.08	Paste, bbls.....lb.	.12	.14	.14	.10
28.00	26.00	28.00	26.00	Brazilwood, sticks, shpmt....lb.	26.00	28.00	28.00	26.00
1.20	.60	.60	.60	Bronze, Aluminum, powd blk.lb.	.60	1.20	1.20	.60
1.25	.55	.55	.55	Gold bulk.....lb.	.55	1.25	1.25	.55
1.60	1.40	1.60	1.42	Butyl, Acetate, normal drs.... .....lb.	.184	.195	.195	.184
1.55	1.35	1.55	1.42	Tank, wks.....lb.	.....	.181	.186	.181
.70	.70	.70	.70	Aldehyde, 50 gal drs wks...lb.	.34	.44	.70	.34
				Carbitol s ee Diethylene Glycol Mono (Butyl Ether).....	.....	.....	.....	.....
				Cellosolv e (see Ethylene glycol mono b utyl ether).....				
				Furoate, tech., 50 gal. dr., lb.	.....	.50	.50	.50
.36	.34	.34	.34	Propionate, drs.....lb.	.25	.27	.36	.25
.60	.60	.60	.60	Stearate, 50 gal drs.....lb.	.25	.30	.60	.25
.60	.57	.57	.57	Tartrate, drs.....lb.	.57	.60	.60	.57
2.00	1.35	1.50	1.35	Cadmium, Sulfide, boxes.....lb.	.95	1.75	1.75	.75
				Calcium			
4.50	3.50	3.50	3.50	Calcium, Acetate, 150 lb bags c-1.....100 lb.	.....	4.50	4.50	4.50
.09	.06	.07½	.07½	Arsenate, 100 lb bbls c-1 wks.....lb.	.07	.09	.09	.07
.06	.05	.05	.05	Carbide, drs.....lb.	.05	.06	.06	.05
1.00	1.00	1.00	1.00	Carbonate, tech, 100 lb bags c-1.....lb.	1.00	1.00	1.00	1.00
27.00	25.00	27.00	27.00	Chloride, Flake, 375 lb drs c-1 wks.....ton	.....	22.75	25.00	22.75
23.00	20.00	21.00	21.00	Solid, 650 lb drs c-1 fob wks .....ton	20.00	20.00	20.00	20.00
52.00	52.00	52.00	52.00	Nitrate, 100 lb bags.....ton	.....	42.00	52.00	42.00
.....	.....	.....	.....	Peroxide, 100 lb. drs.....lb.	.....	1.25	1.25	1.25
.08	.07	.09	.09	Phosphate, tech, 450 lb bbls lb.	.08	.08½	.08	.07
				Stearate, 100 lb bbls.....lb.	.25	.26	.26	.25
				Calurea, bags S. points. c.i.f. ton	.....	88.15	88.15	82.15
.18	.18	.....	.....	Camwood, Bark, ground bbls..lb.	.....	.18	.18	.18
.28	.22	.33	.33	Candelilla Wax, bags.....lb.	.....	.21	.24	.22
				Carbitol, (See Diethylene Glycol Mono Methyl Ether).....	.....	.....	.....	.....
.15	.08	.08	.08	Carbon, Decolorizing, 40 lb bags c-1.....lb.	.08	.15	.15	.08
.12	12	.12	.12	Black, 100-300 lb cases 1c-1 NY.....lb.	.....	.12	.12	.12
.06	.05½	.05½	.05½	Bisulfide, 500 lb drs 1c-1 NY.....lb.	.05½	.06	.06	.05½
.06	.06	.06	.06	Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.06	.06
.07½	07	.07	.07	Tetrachloride, 1400 lb drs delivered.....lb.	.06½	.07	.07½	.06½
.58	.45	.50	.50	Carnauba Wax, Flor, bags....lb.	.36	.37	.43	.35
.60	.40	.90	.54	No. 1 Yellow, bags.....lb.	.....	.33	.40	.33
.38	.34	.37	.24	No. 2 N Country, bags.....lb.	.....	.28	.32	.28
.56	.38	.68	.48	No. 2 Regular, bags.....lb.	.....	.31	.36	.31
.32	.25	.....	.....	No. 3 N. C.....lb.	.....	.24	.25	.24
.32	.25½	.....	.....	No. 3 Chalky.....lb.	.....	.24	.26	.24
.18½	.14½	.18½	.15½	Casein, Standard, ground.....lb.	.15	.16	.17	.15

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

Blood — In common with most of the other members of the fertilizer group, this material fell off considerably during the month and but little business was done even at the lower prices. Quotations are $3.90 per unit at New York, $4.50 per unit at Chicago, and $4.25 per unit South America.

Benzol — General cessation of activities in the iron and steels industries during the past month due to the holidays and the consequent falling off of benzol production, combined to place the market in firm position. Both domestic and export demand continue to be very good. There has been no great curtailment in the amount used for industrial purposes and despite the large amounts previously taken by foreign buyers, the demand for export continues quite heavy. Demands from the automobile industry have been small but recently there has been some evidence of slight increases in the extent of operations in this industry.

Borax — Demand continues widespread and in good volume especially from the glass industry. Exports, which reached the record figure of approximately 68,000 tons in 1928, promise to exceed this total for 1929. For the first ten months of this year over 64,000 tons, valued at $2,361,994 were exported. A decided increase in the value per ton is revealed in the preliminary figures for this year, which show $37, as compared to about $52 per ton for 1928. This is of course due to improved methods of production and the desire of producers to extend the industrial uses of this material by maintaining as low a price as is possible.

Butyl Acetate — Is reported as being quite firm although the entire situation is confused by the tariff situation. Imports are still coming in in very heavy quantities and for that reason the competitive situation is quite acute.

Calcium Acetate — Supplies of this material are much freer due to the combination of circumstances which makes this the heaviest producing season while at the same time it is just now that demands from makers of acetic acid are not so heavy as they have been. The fact that consumers are holding practically no inventories as they go into the new year and that demand for acetic acid is expected to renew during the early part of the new year, is generally thought to be a sign of healthy underlying conditions. There has been practically no export business in this commodity, October shipments amounting to only 152 pounds.

Calcium Chloride — The past month has been the best December in history due to demands from the coal and coke

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cellosolve (see Ethylene glycol mono ethyl ether)			
				Acetate (see Ethylene glycol mono ethyl ether acetate)			
.30	.26	.34	.26	Celluloid, Scraps, Ivory cs....lb.	.....	.20	.30	.20
.20	.18	.18	.18	Shell, cases.....lb.	.18	.20	.20	.18
.32	.30	.34	.26	Transparent, cases.....lb.	.....	.15	.32	.15
1.40	1.40	1.40	1.40	Cellulose, Acetate, 50 lb kegs .lb.	1.20	1.25	1.25	1.20
.03½	.03	.03	.03	Chalk, dropped, 175 lb bbls..lb.	.03	.03½	.03½	.03
.04½	.04½	.02½	.02½	Precip, heavy, 560 lb cks...lb.	.02	.03½	.03½	.02
.03½	.02½	.04½	.04½	Light, 250 lb casks.....lb.	.02½	.03½	.03½	.02½
.19	.18	.18	.18	Charcoal, Hardwood, lump, bulk wks.....bu.	.18	.19	.19	.18
.06½	.06	.06	.06	Willow, powd, 100 lb bbl wks.....lb.	.06	.06½	.06½	.06
.05	.04	.04	.04	Wood, powd, 100 lb bbls...lb.	.04	.05	.05	.04
.03	.02	.03	.02½	Chestnut, clarified bbls wks,..lb.	.02½	.03	.02	.03½
.02	.01½	.02	.01½	25% tks wks.....lb.	.01½	.02½	.02½	.01½
.04 4/5	.04 4/5	.05½	.05½	Powd, 60%, 100 lb bgs wks.lb.	.....	.04½	.04 1/8	.04½
.06	.05½	.06½	.06½	Powd, decolorized bgs wks..lb.	.05½	.06	.06	.05½
9.00	8.00	8.00	8.00	China Clay, lump, blk mines.ton	8.00	9.00	9.00	8.00
.02	.01½	.01½	.01½	Powdered, bbls.....lb.	.01½	.02	.02	.01½
12.00	10.00	10.00	10.00	Pulverized, bbls wks.....ton	10.00	12.00	12.00	10.00
25.00	15.00	15.00	15.00	Imported, lump, bulk.....ton	15.00	25.00	25.00	15.00
.03½	.03	.03	.03	Powdered, bbls.....lb.	.01½	.03	.03½	.01¾
				Chlorine			
.09	.08	.08	.08	Chlorine, cyls lc-1 wks contract .....lb.	.07	.08	.08½	.07
.....	.....	.....	.....	cyls, cl wks,. contract ...lb.	.....	.04½	.04½	.04½
.03½	.03½	.05½	.04	Liq tank or multi-car lot cyls wks contract.....lb.	.025	.025	.03	.025
.07	.07	.07	.07	Chlorobenzene, Mono, 100 lb. drs lc-1 wks.....lb.	.10	.10½	.10½	.08½
.22	.20	.20	.20	Chloroform, tech, 1000 lb drs..lb.	.....	.16	.20	.16
1.35	1.00	1.00	1.00	Chloropicrin, comml cyls.....lb.	1.00	1.35	1.35	1.00
.29	.26	.27	.26	Chrome, Green, CP.....lb.	.26	.29	.29	.26
.11	.06½	.06½	.06½	Commercial.....lb.	.06½	.11	.11	.06½
.17	.15½	.17½	.16½	Yellow.....lb.	.17	.18	.18	.15
.05½	.04½	.05	.04½	Chromium, Acetate, 8% Chrome bbls.....lb.	.04½	.05½	.05½	.04½
.05½	.05½	.05½	.05½	20° soln, 400 lb bbls.....lb.	.....	.05½	.05½	.05½
.28	.27	.27	.27	Fluoride, powd, 400 lb bbl..lb.	.27	.28	.28	.27
.35½	.34½	.34½	.34½	Oxide, green, bbls.....lb.	.34½	.35½	.35½	.34½
9.50	9.00	9.50	9.00	Coal tar, bbls.....bbl	10.00	10.50	10.50	10.00
2.22	2.10	2.10	2.10	Cobalt Oxide, black, bags....lb.	2.10	2.22	2.22	2.10
.87	.84	.92	.77	Cochineal, gray or black bag..lb.	.95	1.01	1.01	.95
.86	.86	.92	.77	Teneriffe silver, bags.....lb.	.....	.95	.95	.95
				Copper			
17.00	12.90	13.57½	12.90	Copper, metal, electrol...100 lb.	.....	17.78	24.00	17.00
.17½	.16	.16½	.06½	Carbonate, 400 lb bbls.....lb.	.13	.21½	.25	.13
.28	.28	.28	.28	Chloride, 250 lb bbls.....lb.	.25	.28	.28	.25
.50	.48	.48	.48	Cyanide, 100 lb drs.....lb.	.44	.45	.60	.44
.17	.16½	.16½	.16½	Oxide, red, 100 lb bbls.....lb.	.24	.32	.32	.16½
.19	.18	.18	.17	Sub-acetate verdigris, 400 lb bbls.....lb.	.18	.19	.19	.18
5.50	5.05	5.00	4.75	Sulfate, bbls c-1 wks...100 lb.	.....	5.50	7.00	5.50
14.00	13.00	17.00	13.00	Copperas, crys and sugar bulk c-1 wks.....ton	13.00	14.00	14.00	13.00
1.35	1.25	1.25	1.25	Sugar, 100 lb bbls.....100 lb.	1.25	1.35	1.35	1.25
.42	.40	.40	.40	Cotton, Soluble, wet, 100 lb bbls.....lb.	.40	.42	.42	.40
.....	.....	42.00	20.00	Cottonseed, S. E. bulk c-1...ton	.....	.....	.....	.....
.....	.....	42.00	20.00	Meal S. E. bulk.....ton	.....	.....	.....	.....
38.00	36.00	35.00	21.50	7% Amm., bags mills...ton	37.50	38.00	38.00	37.50
.27½	.26	.27	.22	Cream Tartar, USP, 300 lb. bbls.....lb.	.26½	.27	.28	.26½
.42	.40	.40	.40	Creosote, USP, 42 lb cbys....lb.	.40	.42	.42	.40½
.19	.17	.20	.20	Oil, Grade 1 tanks.....gal.	.15	.16	.19	.15
.23	.21	.25	.25	Grade 2.....gal.	.13	.14	.23	.13
.28	.25	.....	.....	Grade 3.....gal.	.13	.14	.28	.13
.20	.17½	.17½	.17½	Cresol, USP, drums.....lb.	.14	.17	.17	.14
				Crotonaldehyde, 50 gal dr....lb.	.32	.36	.36	.32
.17	.16	.17	.16	Cudbear, English.....lb.	.16	.17	.17	.16
.18½	.18½	.18½	.15	Cutch, Rangoon, 100 lb bales..lb.	.12½	.13	.16	.12½
.07	.06	.05	.05½	Borneo, Solid, 100 lb bale..lb.	.08	08½	.08½	.08
1.75	1.67½	1.82½	1.67½	Cyanamide, bulk c-1 wks Nitrogen unit.....	.....	2.00	2.00	2.00
5.12	3.77	3.92	3.77	Dextrin, corn, 140 lb bags.100 lb.	4.62	4.82	4.92	4.62
5.07	3.72	3.87	3.72	White, 130 lb bags.....100 lb.	4.57	4.77	4.87	4.57
.09	.08	.08½	.08½	Potato, Yellow, 220 lb bgs..lb.	.08	.09	.09	.08
.09	.08	.08½	.08½	White, 220 lb bags lc-1....lb.	.08	.09	.09	.08
.08½	.08	.08½	.08	Tapioca, 200 lb bags lc-1...lb.	.08	.08½	.08½	.08
3.80	3.80	2.95	2.85	Diamylphthalate, drs wks...gal.	.....	3.80	3.80	3.80
2.90	2.85	3.25	3.25	Dianisidine, barrels.....lb.	.....	2.70	3.10	2.70
.28	.26½	.31½	.29½	Dibutylphthalate, wks.....lb.	.....	.26½	.26½	.26½
.31½	.29½	.55	.55	Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.31½	.29½
.....	.....	.....	.....	Dichloroethylether, 50 gal drs lb.	.05	.07	.13	.05
.65	.55	.23	.23	Dichloromethane, drs wks....lb.	.55	.65	.65	.55
.25	.23	2.15	2.15	Diethylamine, 400 lb drs.....lb.	2.75	3.00	3.00	2.75
2.15	2.15	1.85	1.85	Diethylcarbonate, drs .....gal.	1.85	1.90	1.90	1.85
2.00	1.85	.55	.55	Diethylaniline, 850 lb drs.....lb.	.55	.60	.60	.55
.60	.55.	20	.20	Diethyleneglycol, drs.....lb.	.10	.12	.13	.10
.15	.10	.....	.....	Mono ethyl ether, drs....lb.	.13	.15	.15	.13
.35	.25	.....	.....	Mono butyl ether, drs....lb.	.28	.30	.30	.25
.....	.....	.....	.....	Mono methyl ether, 50 gal. dr.....lb.	.15	.18	.22	.15
.....	.....	.....	.....	Diethylene oxide, 50 gal dr....lb.	.....	.50	.50	.50
.67	.64	.64	.64	Diethylorthotoluidin, drs.....lb.	.64	.67	.67	.64
.26	.24	.25	.25	Diethyl phthalate, 1000 lb drums.....lb.	.24	.26	.26	.24
.35	.30	.30	.30	Diethylsulfate, technical, 50 gal drums.....lb.	.30	.35	.35	.30
2.62	2.62	2.60	2.60	Dimethylamine, 400 lb drs...lb.	.....	2.62	2.62	2.62
.32	.30	.32	.30	Dimethylaniline, 340 lb drs...lb.	.26	.28	.32	.26

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industry in making dustless fuel, and to increased uses by municipalities for snow removal.

Carnauba Wax — Although there has been but little business transacted during the past month, it is reported that the market shows a firmer tendency due to the absence of any considerable stocks both in the domestic market and abroad.

Casein — Continues steady and firm both in this country and in the primary markets. As this is the between-season period, there has been but little buying. Nevertheless, the market has reacted but slightly towards weaker tendencies and quotations are quite firm at 15c @ 16c lb.

Chlorine — The competitive situation has been unusually keen during the past month especially during the last weeks when all efforts were being directed towards closing contracts. As a result, prices declined somewhat from the level which had been maintained previously. Quotations are now at 2.5c lb. on tanks and multi-car lot cylinders, 4¼c lb. on cylinders, carlot, and 7c @ 8c lb. on less carlot.

Copper Sulfate — Conditions in this market are somewhat better than when last reported. It shows a tendency to strengthen and from now on business will undoubtedly increase. Domestic demand has been very light, but, during the lull, exports have been very heavy. Now it is expected that buying for agricultural purposes will start almost immediately and continue throughout the next eight or nine months. During the past few months about the only domestic demand came from Florida, where the material is used all year round as a spray on the ground around the citrus tree. Exports, on the other hand, have been large, 447, 362 pounds, having been shipped out of the country during October. World's copper production during November totaled 170,585 tons as compared with 175,540 tons in October, and 183,813 tons in November 1928. Prices on the metal bid fair to remain unchanged, and it seems quite likely that sulfate prices will go higher as the season advances.

Dextrin — Easier conditions in the grain market have occasioned lower prices during the past month so that white is now at $4.57 @ $4.77 per 100 lbs. and pearl at $4.62 @ $4.82 per 100 lbs.

Divi-Divi — Lack of buying interest has occasioned lower prices on pods which are now quoted at $46.00 per ton.

Ethyl Acetate — The situation is reported as being somewhat improved over that which existed a month ago although supplies on hand are still rather over-plentiful. Quotations are now at

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.50	.45	.45	.45	Dimethylsulfate, 100 lb drs...lb.	.45	.50	.50	.45
.16½	.15½	.15½	.15	Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.16½	.15
.16	.15	.15	.15	Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.15	.13
.34	.32	.32	.32	Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.37	.34
.32	.31	.31	.31	Dinitrophenol, 350 lb bbls....lb.	.31	.32	.32	.31
.19	.18	.18	.15	Dinitrotoluene, 300 lb bbls...lb.	17	.18	.19	.17
.90	.48	1.05	.85	Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.49	.42
.....	.....	.....	.....	Dioxan (See Diethylene Oxide)	.....	.....	.....	.....
				Diphenyl.....lb.	.40	.50	.50	.40
.47	.45	.48	.45	Diphenylamine.....lb.	.....	.40	.47	.40
.72	.40	.....	.....	Diphenylguanidine, 100 lb bbl lb.	.30	.35	.40	.30
.30	.26	.26	.26	Dip Oil, 25%, drums.....lb.	.26	.30	.30	.26
62.00	58.00	49.00	41.00	Divi Divi pods, bgs shipmt..ton	.....	46.50	57.00	46.50
.05½	.05	.04	.04	Extract.....lb.	.05	.05½	.05½	.05
.82	.73	.84	.72	Egg Yolk, 200 lb cases.....lb.	.77	.79	.84	.77
1.75	1.7	2 00	1.75	Epsom Salt, tech, 300 lb bbls c-1 NY..... ....100 lb.	1.70	1.90	1.90	1.70
.38	.37	.45	.37	Ether, USP, 1880, 50 lb drs..lb.	.38	.39	.39	.38
1.05	.75	.90	.90	Ethyl Acetate, 85% Ester, tanks.....lb.	.....	.108	.122	.108
1.25	1.10	1.10	1.03	drums.....lb.	.111	.158	.129	.111
.....	.....	.....	.....	Acetoacetate, 50 gal drs....lb.	.65	.68	.68	.65
1.11	1.05	1.05	1.05	Benzylaniline, 300 lb drs...lb.	1.05	1.11	1.11	1.05
.70	.70	.50	.50	Bromide, tech, drums .....lb.	.50	.55	.55	.50
.....	.....	.....	.....	Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.90	1.85
.22	.22	.22	.22	Chloride, 200 lb. drums....lb.	.....	.22	.22	.22
.....	.....	.....	.....	Chlorocarbonate, 50 gal dr .gal.	.35	.40	.40	.35
.....	.....	.....	.....	Ether, Absolute, 50 gal drs..lb.	.50	.52	.52	.50
				Furoate, 1 lb tins .....lb.	.....	5.00	5.00	5.00
3.50	3.50	3.50	3.50	Lactate, drums works.....lb.	.25	.29	.35	.25
.30	.30	.30	.30	Methyl Ketone, 50 gal drs..lb.	.....	.30	.30	.30
.55	.45	.45	.45	Oxalate, drums works.....lb.	.45	.55	.55	.45
.36	.30	.....	.....	Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.36	.30
.70	.70	.70	.70	Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.70	.79
.85	.75	.75	.75	Chlorhydrin, 40%, 50 gal drs chloro. cont.....lb.	.75	.85	.85	.75
.11	.07	.15	.11	Dichloride, 50 gal drums...lb.	.08	.10	.10	.05
.40	.25	.30	.30	Glycol, 50 gal drs wks.....lb.	.25	.28	.30	.25
.27	.31	.....	.....	Mono Butyl Ether drs wks.	.23	.27	.31	.23
.20	.24	.....	.....	Mono Ethyl Ether drs wks	.16	.20	.24	.16
.23	26	.....	.....	Mono Ethyl Ether Acetate dr. wks.....	.19	.23	.26	.19
				Mono Methyl Ether, drs.lb.	.19	.23	.23	.19
				Oxide, cyl.....lb.	.....	2.00		
.65	.62	.62	.62	Ethylidenaniline.....lb.	.45	.47½	.65	.45
25.00	20.00	20.00	20.00	Feldspar, bulk.....ton	25.00	20.00	25.00	20.00
21.00	15.00	15.00	15.00	Powdered, bulk works....ton	15.00	21.00	21.00	15.00
.09	.07½	.07½	.07½	Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.09	.05
5.50&10	4.90&10	5.60	4.15	Fish Scrap, dried, wks.....unit	.....	4.25&10	4.25&10	3.65&10
4.75&50	4.00&50	3.50	4.24	Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	3.50&50	4.00&50	3.50&50
25.00	25.00	25.00	25.00	Fluorspar, 98%, bags.....	41.00	46.00	46.00	41.00

Formaldehyde

.....	.....	.....	.. ..	Formaldehyde, aniline, 100 lb. drums.....lb.	.....	.....	.....	.....
.42	.39	.39	.39	USP, 400 lb bbls wks.....lb.	.37½	.42	.42	.37½
.09	.08½	.11½	.08½	Fossil Flour.....lb.	.07½	.08	.10	.08½
.04	.02½	.02½	.02½	Fullers Earth, bulk, mines..ton	.02½	.04	.04	.02½
20.00	15.00	15.00	15.00	Imp. powd c-1 bags.....ton	15.00	20.00	20.00	15.00
30.00	25.00	25.00	25.00	Furfural 500 lb drums.....lb.	25.00	30.00	30.00	25.00
.19½	.17½	.17½	.17½	Furfuramide (tech) 100 lb dr..lb.	.17½	.19½	.19½	.17½
.....	.....	.....	.....	Furfuryl Acetate, 1 lb tins....lb.	.....	.30	.30	.30
.....	.....	.....	.....	Alcohol, (tech) 100 lb dr....lb.	.....	5.00	5.00	5.00
.....	.....	.....	.....	Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.50	.50
.....	.....	.....	.....	Fusel Oil, 10% impurities ...gal.	.....	.50	1.00	.50
1.35	1.3	1.69	1.35	Fustic, chips.....lb.	.....	1.35	1.35	1.35
.05	.04	.04	.04	Crystals, 100 lb boxes.....lb.	.04	.05	.05	.04
.22	.20	.20	.20	Liquid, 50°, 600 lb bbls....lb.	.20	.22	.22	.20
.10	.09	.09	.09	Solid, 50 lb boxes.....lb.	.09	10	.10	.09
.23	.20	.20	.20	Sticks.....ton	.14	.16	.16	.14
32.00	30.00	30.00	30.00	G Salt paste, 360 lb bbls.....lb.	25.00	26.00	26.00	25.00
.52	.50	.50	.50	Gall Extract.....lb.	.45	.50	.52	.45
.21	.20	.20	.20	Gambier, common 200 lb cs...lb.	.18	.20	.21	.18
.09	.08	.08	.06	25% liquid, 450 lb bbls....lb.	.06	.07	.07	.06
.14	.12	.12	.12	Singapore cubes, 150 lb bg..lb.	.08	.10	.14	.08
.12	.11	.23	.11	Gelatin, tech, 100 lb cases....lb.	.08½	.09	.09	.08½
.50	.45	.45	.30	Glauber s Salt, tech, c-1 wks.....100 lb.	.45	.50	.50	.45
1.00	.70	1.05	1.05	Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	1.00	1.70	1.70	.70
3.34	3.24	3.24	3.24	Tanner's Special, 100 lb bags .....100 lb.	3.24	3.34	3.34	3.20
3.14	3.14	3.14	3.14	Glue, medium white, bbls ...lb.	.....	3.14	3.14	3.14
.24	.20	.20	.20	Pure white, bbls.....lb.	.20	.24	.24	.20
.26	.22	.22	.22	Glycerin, CP, 550 lb drs.....lb.	.22	.26	.26	.22
.19	.15	.29	.22	Dynamite, 100 lb drs.....lb.	.14	.14½	.16	.13½
.15	.11½	.25	.17	Saponification, tanks.....lb.	.11½	.12	.12½	.10½
.10½	.08½	.....	.....	Soap Lye, tanks.....lb.	.07½	.08	.08½	.07½
.09½	.07½	.....	.....	Graphite, crude, 220 lb bgs...ton	.07	.07½	.07½	.06½
35.00	15.00	15.00	15.00	Flake, 500 lb bbls.....lb.	15.00	35.00	35.00	15.00
.09	.06	.05	.05		.06	.09	.09	.06

Gums

.04½	.03½	.03½	.03½	Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.04½	.03
.06½	.06	.06	.06	Powd, 150 lb bags.....lb.	.06	.06½	.06½	.06½

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10.8c lb. in tanks and 11.1c @ 15.1c lb. in drums.

Formaldehyde — Prices have remained unchanged although raw material has been in excellent supply and in competitive position. Consequently production costs on formaldehyde are said to be considerably lower, although there has as yet been no reflection of this in quoted prices.

Glycerin — Has been at a standstill during the entire month with no business of any proportions reported.

Gums — The past month has seen reductions all along the line but it is pointed out that this is merely a temporary condition which will be righted after the first of the year so that prices will return to the level now quoted. This has been due to the fact that there is no buying interest as consumers have been endeavoring to keep down inventories. But it is known that consumers have no stocks on hand on price concessions and will be absent after the turn of the year. An annual report on the kauri gum industry states that in the early part of this year, a considerable supply of gum stocks accumulated by dealers and others since the boom year of 1920 remained unsold. During the year, gum prices were low, diggers left the fields and production fell off. Old stocks were sold with the result that a demand was created for Government supplies which were sold without disturbing the market or materially affecting current production. Gum washing operations were continued longer than usual this year owing to a wet spring in the north of Auckland which should cause an increase in gum output. Gum receipts at Auckland for ten months this year totaled 3,378 metric tons as against 3,351 metric tons last year. Nine months figures for exports indicate 3,869 metric tons, valued at $963,000, an increase of 551 metric tons over last year's period. From consular invoices gum exports to the United States compiled during the first ten months of 1929 attained 1,685 metric tons for a value of $552,090 as compared with 1,823 metric tons, having a value of $585,307 for 1928. Trade estimates the 1929-30 crop of sandarac gum at about 120 metric tons. Gum arrivals at Casablanca for ten months this year amounted to from 40 to 45 tons, leaving a balance to be shipped from the interior of about 75 or 80 tons. Total gum exports during ten months were 37 tons, out of which 14 tons went to Germany, 12 tons to the United States and 10 tons to France.

Mercury — Conditions in this market have been entirely stagnant during the past month, making it one of the worst months of the year. However, the market

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.20	.18	.18	.18	Yellow, 150-200 lb bags....lb.	.18	.20	.20	.18
				Animi (Zanzibar) bean & pea				
.40	.35	.40	.35	250 lb cases.....lb.	.35	.40	.40	.35
.55	.50	.60	.50	Glassy, 250 lb cases.....lb.	.50	.55	.55	.50
				Asphaltum, Barbadoes (Manjak)				
.12	.09	.09	.09	200 lb bags.....lb.	.09	.12	.12	.09
.17	.15	.15	.15	Egyptian, 200 lb cases.....lb.	.15	.17	.17	.15
				Gilsonite Selects, 200 lb bags				
65.00	55.00	55.00	55.00	.....ton	58.00	65.00	65.00	58.00
				Damar Batavia standard 136, lb				
.26	.22½	.26½	.26½	cases.....lb.	.22	.22½	.26	.22
.11	.10½	.10½	.07	Batavia Dust, 160 lb bags.....lb.	.10½	.11	.11	.10½
.17½	.16	.18½	.17½	E Seeds, 136 lb cases.....lb.	.15	.15½	.17½	.15
				F Splinters, 136 lb cases and				
.14½	.13	.14	.09	bags.....lb.	.13	.13½	.13½	.13
.30½	.29½	.34	.33½	Singapore, No 1, 224 lb cases lb.	.26	.28	.30½	.26
.24	.20	.22½	.21	No. 2, 224 lb cases.....lb.	.....	.21½	.24	.21½
.15	.13½	.14	.11	No. 3, 180 lb bags.....lb.	.10	.11½	.14	.10
				Benzoin Sumatra, U. S. P. 120 lb				
.48	.33	.35	.30	cases.....lb.	.38	.40	.40	.38
				Copal Congo, 112 lb bags, clean				
.15	.14	.14	.12	opaque.....lb.	.16	.17	.17	.14
.09	.08½	.08½	.08½	Dark, amber.....lb.	.08½	.09	.09	.08½
.14	.12½	.12½	.12½	Light, amber.....lb.	.12½	.14	.14	.12½
.36	.35	.35	.35	Water white.....lb.	.35	.36	.36	.35
.65	.58	.....	.....	Mastic:.....lb.	.63	.65	.65	.58
				Manila, 180-190 lb baskets				
.17½	.16	.16	.16	Loba A.....lb.	.17	.17½	.17½	.17
.16½	.15	.15	.15	Loba B.....lb.	.15½	.16	.16½	.15½
.14	.13	.14½	.13	Loba C.....lb.	.13½	.14	.14½	.13½
.19	.16	.16	.16	Pale bold, 224 lb cs.....lb.	.17	.19	.19	.17
.13½	.12	.14	.12	Pale nubs.....lb.	.13	.13½	.13½	.13
.11	.07½	.07½	.07½	East Indies chips, 180 lb bags lb.	.10	.11	.11	.10
.21	.17	.....	.....	Pale bold, 180 lb bags....lb.	.20	.21	.21	.20
.16	.14	.17	.17	Pale nubs.....lb.	.15	.16	.16	15
.....	.....	.....	.....	Pontianak, 224 lb cases....lb.	.....	.....		
.25½	.22	.29	.25	Pale bold gen No 1.....lb.	.20	.21	.23	.20
.15	.13	.19	.13	Pale gen chips spot.....lb.	.14½	.15	.15	.14½
.14	.13	.14	.13	Elemi, No. 1, 80-85 lb cs...lb.	.13½	.14	.14	.13½
.13½	.13	.13	.12	No. 2, 80-85 lb cases.....lb.	.13	.13½	.13½	.13
.13	.12	.13	.11	No. 3, 80-85 lb cases.....lb.	.12	.13	.13	.12
				Kauri, 224-226 lb cases No. 1				
.57	.50	.67½	.57	.....lb.	.50	.57	.57	.50
.38	.35	.44½	.38	No. 2 fair pale.....lb.	.35	38	.38	.35
				Brown Chips, 224-226 lb				
.12	.10	.14½	.10	cases.....lb.	.10	.12	.12	.10
.....	.....	.42	.38	Bush Chips, 224-226 lb	.....	.....		
.40	.38	.....	.....	cases.....lb.	.38	.40	.40	.38
.....	.....	.....	.....	Pale Chips, 224-226 lb cases				
.26	.24½	.31½	.24½	.....lb.	.24½	.26	.26	.24½
				Sandarac, prime quality, 200				
.60	.26	.27	.25	lb bags & 300 lb casks...lb.	.40	.38	.72	.35
.....	.....	.....	.....	Helium, 1 lit. bot. .....lit.	.....	25.00	.20	.17
.20	.17	.12	.12	Hematine crystals, 400 lb bbls lb.	.14	.18	.20	.14
.11	.11	.09	.09	Paste, 500 bbls.....lb.	.....	.11	.11	.11
.03½	.03½	.03½	.03½	Hemlock 25%, 600 lb bbls wks lb.	.03	.03½	.03½	.03
16.00	16.00	16.00	16.00	Bark.....ton	.....	16.00	17.00	16.00
.60	.60	.60	.45	Hexalene, 50 gal drs wks.....lb.	.....	.60	.60	.60
.56	.62	.80	.62	Hexamethylenetetramine, drs .lb.	.48	.50	.58	.48
4.00	4.00	3.35	2.75	Hoof Meal, fob Chicago....unit	.....	3.75	4.00	3.75
.....	.....	3.90	3.0	South Amer. to arrive....unit	.....	3.75	3.90	3.75
				Hydrogen Peroxide, 100 vol, 140				
.26	.24	.30	.22	lb cbys.....lb.	.24	.26	.26	.24
.15	.12	.12	.12	Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.15	.12
1.30	1.28	1.28	1.20	Indigo Madras, bbls.....lb.	1.28	1.30	1.30	1.28
.18	.15	.15,	.18	20% paste, drums.....lb.	.15	.18	.18	.15
				Synthetic, liquid.....lb.	.....	.12	.12	.12
				Iron Chloride, see Ferric or				
				Ferrous				
.10	.09	.09	.09	Iron Nitrate, kegs.....lb.	.09	.10	.10	.09
3.25	2.50	2.50	2.50	Coml, bbls.....100 lb.	2.50	3.25	3.25	2.50
.12	.10	.10	.10	Oxide, English.....lb.	.10	.12	.12	.10
.03½	.02½	.02½	.02½	Red, Spanish.....lb.	.02½	.03½	.03½	.02½
.90	.85	.85	.85	Isopropyl Acetate, 50 gal drs gal.	.85	.90	.90	.85
.20	.17	.29	.17	Japan Wax, 224 lb cases.....lb.	.....	.16	.18	.16
70.00	60.00	60.00	60.00	Kieselguhr, 95 lb bgs NY....ton	60.00	70.00	70.00	60.00
.....	.....	14.00	13.00	Lead Acetate, bbls wks...100 lb.	13.00	13.50	13.50	13.00
				White crystals, 500 lb bbls				
13.50	13.00	14.00	13.00	wks.....100 lb.	14.00	14.50	14.50	14.00
.15	.13	.15½	.13½	Arsenate, drs 1c-1 wks.....lb.	.13	.15	.15	.13
				Dithiofuroate, 100 lb dr....lb.	.....	1.00		
6.25	6.25	7.80	6.20	Metal, c-1 NY.....100 lb.	.....	7.75	7.75	6.10
.14	.14	.14	.14	Nitrate, 500 lb bbls wks....lb.	.....	.14	.14	.14
.18	.17½	.17½	.17½	Oleate, bbls.....lb.	.17½	.18	.18	.17½
.08½	.08½	.10½	.08½	Oxide Litharge, 500 lb bbls.lb.	.....	.08½	.08½	.08½
.09½	.09½	.11½	.09½	Red, 500 lb bbls wks....lb.	.....	.09½	.09½	.09½
.09	.09	.09½	.09	White, 500 lb bbls wks...lb.	.....	.09½	.09½	.09
.08½	.08½	.09	.08½	Sulfate, 500 lb bbls wk...lb.	.....	.08½	.08½	.08½
				Leuna saltpetre, bags c.i.f....ton	.....	57.00	57.00	52.00
				S. points c. i. f.....ton	.....	57.30	57.30	52.30
4.50	4.50	4.50	4.50	Lime, ground stone bags.....ton	.....	4.50	4.50	4.50
1.05	1.05	1.05	1.05	Live, 325 lb bbls wks...100 lb.	.....	1.05	1.05	1.05
				Lime Salts, see Calcium Salts				
.17	.15	.15	.15	Lime-Sulfur soln bbls.....gal.	.15	.17	.17	.15
				Lithopone, 400 lb bbls 1c-1 wks				
.06½	.06½	.06½	.06½	.....lb.	.....	.05½	.06½	.05½
.08½	.08½	.08½	.08½	Logwood, 51°, 600 lb bbls.....lb.	.08½	.08½	.08½	.08½
.03½	.03	.03	.03	Chips, 150 lb bags.....lb.	.03	.03½	.03½	.03
.12½	.12½	.12	.12	Solid, 50 lb boxes.....lb.	.....	.12½	.12½	.12½
27.00	26.00	26.00	26.00	Sticks.....ton	24.00	26.00	26.00	24.00
.08	.07½	.07½	.07½	Lower grades.....lb.	.07½	.08	.08	.07½
.30	.30	.30	.30	Madder, Dutch.....lb.	.22	.25	.25	.22
50.00	48.00	48.00	48.00	Magnesite, calc, 500 lb bbl...ton	50.00	60.00	60.00	50.00
				Magnesium				
.06½	.06	.06½	.06	Magnesium Carb, tech, 70 lb bags NY.....lb.	.06	.06½	.06½	.06

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

is firm at prevailing price quotations set by the combine.

Methanol — Business has again been below normal during the past month and with production fairly heavy, has made for an acute competitive situation. Prices are all reported to be nominal with shading all along the line on all grades. October production of crude methanol, based on reports by the entire industry to the Department of Commerce, was 716,789 gallons, as compared with 598,548 gallons in September and 641,823 gallons in October, 1928. Stocks of crude methanol at plants at the end of October totaled 251,704 gallons, compared with 314,171 gallons at the end of October last year. For the ten months, crude methanol production amounted to 6,883,156 gallons. compared with 6,062,626 gallons for the same time last year. Production of refined methanol during October, 445,183 gallons, compared with 432,094 in September and with 487,384 in October last year. For ten months, 4,378,356 gallons, compared with 4,778,329 gallons during the ten months of 1928. Methanol imports into the United States, entered for consumption, during the first eight months of 1929, according to preliminary figures, amounted to 489,518 gallons valued at $196,513. This represents an increase of 29 per cent in quantity and 52 per cent in value over the amount imported for consumption during the entire year of 1928, aggregating 379,291 gallons, value $129, 339.

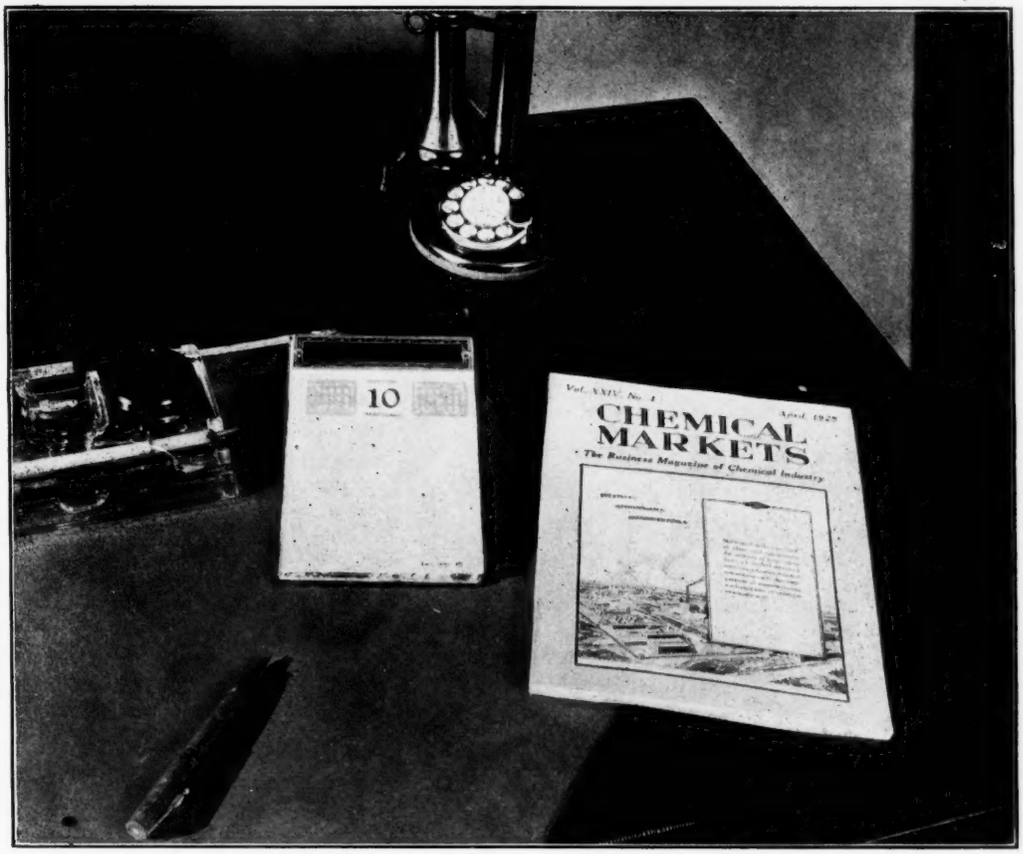
Naphthalene — The market has been quite firm with good consuming demand. Imports of crude, solidifying at less than 79 degrees C. have increased noticeably during the past year. For the first nine months of 1929, 27,424,000 pounds were entered for consumption as compared with 13,207,000 pounds during the corresponding period of 1928. Imports for the year 1928 of crude naphthalene, duty free, amounted to 19,926,289 pounds, so that the 1929 three-quarter imports exceed by over 50 per cent the total of the 1928 importations. Total 1928 production in the United States of naphthalene amounted to 46,157,425 pounds, inclusive of 12,182,143 pounds of crude and refined produced in by-product coke plants. In 1927, production aggregated 53,754,441 pounds of which 8,256,000 pounds came from by-product coke plants.

Phenol — Although consumption has fallen off considerably during the past few months due to curtailment of automobile and radio production. the market is still reported as being quite firm and there has been no actual change in price.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Chloride flake, 375 lb. drs c-l wks.....ton	.....	36.00	36.00	36.00
37.00	27.00	37.00	37.00	Imported shipment.....ton	.....	33.00	33.00	33.00
33.00	33.00	33.00	33.00	Fused, imp, 900 lb bbls NY ton	.....	31.00	31.00	31.00
31.00	31.00	31.00	31.00	Fluosilicate, crys, 400 lb bbls wks.....lb.	.10	.10½	.10½	.10
.10½	.10	.10	.10	Oxide, USP, light, 100 lb bbls .....lb.	.....	.42	.42	.42
.42	.42	.42	.42	Heavy, 250 lb bbls.....lb.	.....	.50	.50	.50
.50	.50	.50	.50	Peroxide, 100 lb cs.....lb.	1.00	1.25	1.25	1.00
.....	.....	.....	.....	Silicofluoride, bbls.....lb.	.09¾	.10½	.10½	.09¾
.10½	.09¾	.12½	.09¾	Stearate, bbls.....lb.	.25	.26	.26	.25
.25	.23	.23	.23	Manganese Borate, 30%, 200 lb bbls.....lb.	.....	.19	.24	.19
.24	.24	.24	.24	Chloride, 600 lb casks.....lb.	.08	.08½	.08½	.08
.08½	.08	.08	.08	Dioxide, tech (peroxide) drs lb.	.04½	.06	.06	.04½
.....	.....	.05	.04½	Ore, powdered or granular 75-80%, bbls.....lb.	.02½	.03	.03½	.02½
.50	.35	.....	.....	80-85%, bbls.....lb.	.....	.03½	.04½	.03½
.03½	.03	.03	.03	85-88%, bbls.....lb.	.04	.04½	.05½	.04
.04½	.04	.04	.04	Sulfate, 550 lb drs NY.....lb.	.07	.08	.08½	.07
.05½	.05	.05	.05	Mangrove 55%, 400 lb bbls..lb.	.03½	Nom.	Nom.	.03½
.07½	.07	.07	.07	Bark, African.....ton	.....	33.00	35.00	30.00
Nom.	.03½	.03½	.03½	Marble Flour, bulk.....ton	14.00	15.00	15.00	14.00
45.00	39.000	034.00	0 1 3.	Mercurous chloride .....lb.	.....	2.05	2.05	2.05
12.00	10.00	10.00	5 .	Mercury metal.....75 lb flask	124.00	125.00	126.00	120.00
132.00	121.00	129	99.00 .00	Meta-nitro-aniline.....lb.	.67	.69	.74	.67
.74	.72	.72	.72	Meta-nitro-para-toluidine 200 lb. bbls.....lb.	1.50	1.55	1.55	1.50
1.80	1.50	1.70	1.70	Meta-phenylene-diamine 300 lb. bbls.....lb.	.80	.84	.90	.80
.94	.90	.90	.90	Meta-toluene-diamine, 300 lb bbls.....lb.	.67	.69	.72	.67
.74	.72	.72	.72					

Methanol

				Methanol, (Wood Alcohol),....				
.58	.46	.80	.55	95%.....gal.	.51	.53	.65	.51
.60	.47	.87	.57	97%.....gal.	.53	.55	.65	.53
.63	.44	.....	.....	Pure.....gal.	.53	.55	.68	.53
.58	.48	.....	.....	Synthetic, drums c-l.....gal.	.54	.55	.66	.54
.75	.45	.80	.75	Denat. gre. tanks.....gal.	.....	.55	.62	.55
.95	.95	.95	.95	Methyl Acetate, drums.....gal.	.....	Nom.	.95	.95
.90	.68	.88	.75	Acetone, 100 gal drums...gal.	.73	.77	.85	.73
.95	.85	1.00	.85	Anthraquinone, kegs.....lb.	.85	.95	.95	.85
				Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....
.....	.....	.....	.....	Chloride, 90 lb cyl.....lb.	.45	.45	.60	.45
60	.55	.55	.55	Furoate, tech., 50 gal. dr., .lb.	.....	.50	.50	.50
80.00	65.00	.03½	.03½	Mica, dry grd. bags wks.....lb.	65.00	80.00	80.00	65.00
115.00	110.00	.05½	.05½	Wet, ground, bags wks.....lb.	110.00	115.00	115.00	110.00
.....	.....	3.00	3.00	Michler's Ketone, kegs.....lb.	.....	3.00	3.00	3.00
.75	.70	.70	.70	Monochlorobenzene, drums see, Chorobenzene, mono.....lb.				
				Monoethylorthotoluidin, drs. lb.	.70	.75	.75	.70
4.20	3.95	3.95	3.95	Monomethylparaminosufate 100 lb drums.....lb.	3.75	4.00	4.20	3.75
.07	.06½	.06½	.06½	Montan Wax, crude, bags....lb.	.06½	.07	.07	.06½
.04½	.04½	.04	.04	Myrobalans 25%, liq bbls....b	.03½	.04½	.04½	.03½
.08½	.08	.08	.08	50% Solid, 50 lb boxes.....lb.	.05	.05½	.08½	.05
50.00	42.00	43.50	41.00	J1 bags.....ton	.....	41.00	43.00	40.00
40.00	32.50	37.00	23.50	J 2 bags.....ton	.....	26.50	40.00	26.50
40.00	32.50	37.00	30.00	R 2 bags.....ton	.....	27.50	34.00	27.50
.18	.18	.21	.18	Naphtha, v. m. & p. (deodorized) bbls.....gal.	.....	.16	.18	.16
				Naphthalene balls, 250 lb bbls wks.....lb.	.....	.05½	.05½	.05½
.06	.05½	.06	.05½	Crushed, chipped bgs wks..lb.	.....	.04½	.04½	.04½
.04½	.04½	.04½	.04½	Flakes, 175 lb bbls wks....lb.	.....	.05	.05	.05
.05	.05	.05	.04½	Nickel Chloride, bbls kegs....lb.	.20	.21	.24	.20
.24	.21	.21	.21	Oxide, 100 lb kegs NY.....lb.	.37	.40	.40	.37
.38	.35	.35	.35	Salt bbl. 400 bbls lb NY...lb.	.....	.13	.13	.13
.09¾	.09	.09	.08½	Single, 400 lb bbls NY.....lb.	.....	.13	.13	.13
.09	.08¾	.08¾	.08	Nicotine, free 40%, 8 lb tins, cases.....lb.	1.25	1.30	1.30	1.25
1.30	1.25	1.25	1.10	Sulfate, 10 lb tins.....lb.	.98½	1.20	1.20	.98½
1.20	.98½	1.10	1.10	Nitre Cake, bulk .....ton	14.50	18.00	18.00	12.00
14.00	13.00	13.00	13.00	Nitrobenzene, redistilled, 1000 lb drs wks.....lb.	.09	.09¾	.10¼	.09
.10½	.10½	10½	.09½	Nitrocellulose, c-l-l-cl, wks...lb.	.25	.36	.36	.25
Nom.	.40	.40	.40	Nitrogenous Material, bulk..unit	.....	3.40	4.00	3.40
4.00	3.35	3.60	3.35	Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.25	.25
.25	.25	.25	.25	Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.15	.14
.15	.14	.14	.14	Nutgalls Aleppy, bags.....lb.	.16	.16½	.16½	.16
Nom.	.25	.25	.25	Chinese, bags.....lb.	.12	.13	.13	.12
.18	.17	.17	.17	Oak Bark, ground.....ton	30.00	35.00	50.00	30.00
50.00	45.00	45.00	45.00	Whole.....ton	20.00	23.00	23.00	20.00
23.00	20.00	20.00	20.00	Orange-Mineral, 1100 lb casks NY.....lb.	.11½	.13	.13½	.11½
.13½	.13	.14½	.13	Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.25	2.15
2.25	2.20	2.20	2.20	Orthoanisidine, 100 lb drs....lb.	2.50	2.60	2.60	2.50
2.50	2.35	2.50	2.35	Orthochlorophenol, drums....lb.	.50	.65	.65	.50
.65	.50	.50	.50	Orthocresol, drums.....lb.	.18	.28	.28	.18
.28	.18	.18	.18	Orthodichlorobenzene, 1000 lb drums.....lb.	.07	.10	.10	.07
.07	.06	.06	.06	Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.30	.33	.33	.30
.35	.32	.32	.32	Orthonitrotoluene, 1000 lb drs wk.....lb.	.16	.18	.18	.16
.18	.17	.13	.13	Orthonitrophenol, 350 lb dr...lb.	.85	.90	.90	.85
.90	.85	.85	.85	Orthotoluidine, 350 lb bbl 1c-1 lb.	.25	30	.30	.25
.31	.29	.29	.25					



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25 Spruce Street, New York City

The Business Magazine of the Chemical Industry

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

Potassium Chlorate — Is reported as being in fairly strong position with most of the contracts already closed at prevailing price quotations. Although imports have been coming in in good quantity, it is said that some shortness of stocks may develop which may result in a higher price tendency.

Rosins — After some falling off during the middle of the month, the higher grades recovered somewhat towards the close and finished at higher prices than when last quoted. However, the lower grades are all considerably off. Exports for November were well ahead of those of last year amounting to $1,269,136 as compared with a value of $1,175,928 in the corresponding month of last year. Gum rosin also registered the greatest export gain for the first eleven months of the year amounting to $15,907,060 as compared with a value of $14,189,344 for the first eleven months of 1928.

Salt Cake — The shortage of this material is quite pronounced and the market is very firm. Except for material moving forward under contract, supplies are very scarce with no offers being made. Stocks are very small, with recent imports sold before their arrival, and a further upward revision of prices seems impending.

Shellac — Has fallen off considerably during the past month. Business has been practically at a standstill and prices are 4c @ 5c lb. lower than when last quoted. Bone dry is at 47c lb., garnet at 40c lb., superfine at 39c lb., and T. N. at 36c lb. in a very quiet and easy market.

Soda Ash — Continues in exceptionally fine condition, with business exceeding all forecasts for December. With the exception of the flat glass industry which is below normal, and the textile industry, which is about normal, all the other consuming industries are using more of this material than was expected and exceeding last year's consumption. Contracts are from three to four per cent ahead of last year at this time and hence it seems that there is no lack of confidence in the future, since there seems to be no reluctance to make committments for the alkali generally.

Soda Caustic — Has not been as strong as December a year ago. However, this is offset by the fact that January orders are far ahead of those of last year. This combination of facts would seem to indicate that the holding off has been chiefly due to the inventory, with consumers wishing to enter the new year with as little of this as possible on their books, preferring to do the buying after the first of the year. This seems inconsistent when the position of ash is considered, except for the fact that ash is a cheaper com-

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Orthonitroparachlorphenol, tins			
.75	.70	70	.70	.....lb.	.70	.75	.75	.70
.17	.16	.16	.16	**Osage Orange, crystals**.....lb.	.16	.17	.17	.16
.07	.07	.07	.07	51 deg. liquid.....lb.	.07	.07½	.07½	.07
.15	.14½	.14½	.14½	Powdered, 100 lb bags.....lb.	.14½	.15	.15	.14½
				Paraffin, refd, 200 lb cs slabs			
.06¾	.06½	.06½	.06½	123-127 deg. M. P.....lb.	.04½	.04½	.06¾	.04½
.07¾	.07½	.07½	.07½	128-132 deg. M. P.....lb.	.04½	.06¾	.07	.04½
.08½	.08	.08	.08	133-137 deg. M. P. .....lb.	.06½	.07¼	.07¾	.06¼
.28	.20½	.29	.26	**Para Aldehyde, 110-55 gal drs**..lb.	.20½	.23	.28	.20½
1.05	1.00	1.00	1.00	Aminoacetanilid, 100 lb bg..lb.	1.00	1.05	1.05	1.00
				Aminohydrochloride, 100 lb				
1.30	1.25	1.25	1.25	kegs.....lb.	1.25	1.30	1.30	1.25
1.15	1.15	1.15	1.15	Aminophenol, 100 lb kegs..lb.	.99	1.02	1.15	.99
.65	.50	.50	.50	Chlorophenol, drums.....lb.	.50	.65	.65	.50
.....	.....	.12	.12	Coumarone, 330 lb drums..lb.	.....	.....	.....	.....
2.50	2.25	2.25	2.25	Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.50	2.25
				Dichlorobenzene, 150 lb bbls				
.20	.17	.17	.17	wks.....lb.	.17	.20	.20	.17
.55	.50	.53	.50	Nitroacetanilid, 300 lb bbls.lb.	.50	.55	.55	.50
				Nitroaniline, 300 lb bbls wks				
.59	.48	.52	.52	.....lb.	.48	.55	.55	.48
				Nitrochlorobenzene, 1200 lb drs				
.32	.32	.32	.32	wks.....lb.	.23	.26	.26	23
				Nitro-orthotoluidine, 300 lb				
2.85	2.75	2.75	2.75	bbls.....lb.	2.75	2.85	2.85	2.75
.55	.50	.50	.50	Nitrophenol 185 lb bbls....lb.	.45	.50	.55	.45
				Nitrosodimethylaniline, 120 lb.				
.94	.92	.92	.92	bbls.....lb.	.92	.94	.94	.92
.30	.30	.30	.25	Nitrotoluene, 350 lb bbls....lb.	.29	.31	.31	.29
				Phenylenediamine, 350 lb bbls				
1.20	1.15	1.20	1.15	.....lb.	1.15	1.20	1.20	1.15
				Toluenеulfonamide, 175 lb				
.41	.40	.40	.40	bbls.....lb.	.70	.75	.75	.70
				Toluenesulfonchloride, 410 lb				
.22	.20	.20	.18	bbls wks.....lb.	.20	.22	.22	.20
.42	.40	.45	.38	Toluidine, 350 lb bbls wk...lb.	.38	.40	.42	.38
				Paris Green, Arsenic Basis				
.25	.20	.21	.21	100 lb kegs.....lb.	.....	.27	.27	.25
.23	.17	.19	.19	250 lb kegs.....lb.	.....	.25	.25	.23
.....	.....	.25	.25	**Persian Berry Ext., bbls**.....lb.	.25	Nom.	.25	.25
.03	.02½	.02½	.02½	**Petrolatum, Green, 300 lb bbl**.lb.	.02	.02½	.02½	.02
.13	.20	.18	.16	**Phenol, 250-100 lb drums**.....lb.	.14½	.15	.16	.13
				Phenyl - Alpha - Naphthylamine,				
1.35	1.35	1.35	1.28	100 lb kegs.....lb.	.....	1.35	1.35	1.35

Phosphate

				Phosphate Acid (see Superphosphate)			
				Phosphate Rock, f.o.b. mines			
3.15	3.00	3.00	3.00	Florida Pebble, 68% basis..ton	3.00	3.15	3.15	3.00
3.65	3.50	3.50	3.50	70% basis.....ton	3.75	4.00	4.00	3.50
4.15	4.00	4.00	3.85	72% basis.....ton	4.25	4.50	4.50	4.00
5.00	5.00	5.35	5.00	75-74% basis.....ton	5.25	5.50	5.50	5.00
5.75	5.75	5.75	5.60	75% basis.....ton	.....	5.75	5.75	5.75
6.25	6.25	6.25	6.00	77-76% basis.....ton	.....	6.25	6.25	6.25
5.00	5.00	5.50	5.00	Tennessee, 72% basis.....ton	.....	5.00	5.00	5.00
				Phosphorous Oxychloride 175 lb				
.40	.35	.35	.35	cyl.....lb.	.20	.25	.40	.20
.65	.60	.65	.60	Red, 110 lb cases.....lb.	.37½	.42	.60	.37½
.32	.32	.32	.32	Yellow, 110 lb cases wks..lb.	.31	.37½	.32	.31
.46	.46	.46	.46	Sesquisulfide, 100 lb cs.....lb.	.....	.44	.46	.44
.....	.....	.35	.35	Trichloride, cylinders.....lb.	.20	.25	.35	.20
				Phthalic Anhydride, 100 lb bbls				
.20	.18	.18	.18	wks.....lb.	.18	.20	.20	.18
				Pigments Metallic, Red or brown				
45.00	37.00	40 00	37.00	bags, bbls, Pa. wks.....ton	37.00	45.00	45.00	37.00
				Pine Oil, 55 gal drums or bbls				
.64	.63	.63	.63	Destructive dist.....lb.	.63	.64	.64	.63
10.60	8.00	8.00	8.00	Prime bbls.....bbl.	8.00	10.60	10.60	8.00
.70	.70	.70	.66	Steam dist. bbls.....gal.	.65	.70	.70	.65
				Pitch Hardwood,				
45.00	40.00	40.00	40.00	wks.....ton	40.00	45.00	45.00	40.00
				Plaster Paris, tech, 250 lb bbls				
3.30	3.30	3.30	3.30	.....bbl.	3.30	3.50	3.50	3.30

Potash

.07½	.07½	.07½	.07½	**Potash, Caustic, wks, solid**...lb.	.06½	.06¾	.07½	.06½
.07½	.07½	.07½	.07½	flake.....lb.	.0705	.08	.07½	.0705
				Potash Salts, Rough Kainit				
9.00	9.00	9.00	9.00	12.4% basis bulk.....ton	.....	9.10	9.10	9.00
9.50	9.50	9.50	9.50	14% basis.....ton	.....	9.60	9.60	9.50
				Manure Salts				
12.40	12.40	12.40	12.40	20% basis bulk.....ton	.....	12.50	12.50	12.40
18.75	18.75	18.75	18.75	30% basis bulk.....ton	.....	18.95	18.95	18.75
				Potassium Muriate, 80% basis				
36.40	36.40	36.40	36.40	bags.....ton	.....	36.75	36.75	36.40
				Pot. & Mag. Sulfate, 48% basis				
27.00	27.00	27.00	27.00	bags.....ton	.....	27.50	27.50	27.00
				Potassium Sulfate, 90% basis				
47.30	47.30	47.30	47.30	bags.....ton	.....	47.75	47.75	47.30
				Potassium Bicarbonate, USP, 320				
.09½	.09	.09	.09	lb bbls.....lb.	.09½	.10	.14	.09½
				Bichromate Crystals, 725 lb				
.09½	.08½	.08½	.08	casks.....lb.	.09	.09½	.09½	.09
.12½	.12	.12	.11	**Powd., 725 lb cks wks**....lb.	.13	.13½	.13½	.13

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

modity and the inventory complex does not apply. The oil industry has been one of the outstanding buyers.

Sodium Chlorate — Continues in exceptionally strong position with some sales reported as high as 11c lb. Shipments continue to move forward just as fast as possible, but are reported to be behind schedule and it is thought that when the heavy consuming season finally opens the price tendency will be decidedly upwards.

Sodium Nitrate — The higher priced grade of this material is probably the only member of the fertilizer group which has shown any activity during the past month. Business generally has been inactive but this market is firm with January prices at $2.13 @ $2.22 per 100 lbs. It is expected that the nitrate restriction scheme now under consideration in London will aid matters in this market which is in danger of being overproduced. Production of nitrate of soda by the 69 operating oficinas amounted to 207,800 metric tons in October, 1929, as compared with 282,300 tons for the same month of the previous year. Exports for October, 1929, totaled 261,400 tons against 283,800 tons in 1928. World stocks reached 2,300,100 tons as compared with 1,839,300 tons in 1928. The visible supply as of November 30, amounted to 2,410,000 tons as compared with 1,959,000 tons at the same time in 1928, and 1,388,000 tons in 1927. Of this amount, 241,000 tons are in the United States as compared with 179,000 tons in 1928 and 106,000 tons in 1927.

Sodium Sulfide — Is reported to be in very firm position with stocks low and prices showing a rising tendency. A report from England announces the fact that British producers have raised their prices about $5 per ton on this commodity.

Starch — As the corn market declined during the past month, the prices of starch followed in its wake and thus quotations are 10c per 100 lbs. lower than when last quoted. Quotations are at $3.72 @ $3.92 per 100 lbs. on pearl and $3.82 @ $4.02 on powdered.

Sulfur — Exports have been moving forward at an accelerated rate although prices remain unchanged. The gain in American sulfur exports at the end of the first 10 months of 1929 was 133,827 in tonnage and $2,492,000 in value over the corresponding period of 1928. Totals were, respectively: 1928 (10 months), 602,405 tons, value $12,608,873; 1929 (10 months), 726,232 tons, value $15,100,872.

Turpentine — After lapsing somewhat during the middle of the past month, this material recovered in good shape during

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.17	.16	.16	.16	Binoxiate, 300 lb bbls.....lb.	.14	.17	.17	.14
.30	.30	.30	.30	Bisulfate, 100 lb kegs.....lb.	.....	.30	.30	.30
.05½	.05½	.05½	.05½	Carbonate, 80-85% calc. 800 lb casks.....lb.	.05½	.05½	.05½	.05½
.09	.06½	.08½	.08½	Chlorate crystals, powder 112 lb keg wks.....lb.	.08½	.09	.09	.08½
.05½	.05½	.05½	.05½	Chloride, crys bbls.....lb.	.05½	.05½	.05½	.05½
.28	.27	.27	.27	Chromate, kegs.....lb.	.23	.28	.28	.23
.57½	.55	.55	.55	Cyanide, 110 lb. cases.....lb.	.55	.57½	.57½	.55
.12	.11½	.11½	.11½	Metabisulfite, 300 lb. bbl...lb.	.12	.13	.13	.11½
.17	.16	.16	.16	Oxalate, bbls.....lb.	.20	.24	.24	.16
.12	.11	.11	.11	Perchlorate, casks wks.....lb.	.11	.12	.12	.11
.15½	.15	.15½	.14½	Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.16	.16½	.16½	.16
.38	.37	.39	.37½	Prussiate, red, 112 lb keg...lb.	.38	.40	.40	.38
.18½	.18	.18	.18	Yellow, 500 lb casks.....lb.	.18½	.21	.21	.18½
.51	.51	.51	.51	Tartrate Neut, 100 lb keg..lb.	.....	.21	.51	.51
.25	.25	.25	.25	Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.25	.21
.....	.....	.....	.. ..	Propyl Furoate, 1 lb tins.....lb.	.....	5.00	5.00	5.00
.05	.04	.04	.04	Pumice Stone, lump bags.....lb.	.04	.05	.05	.04
.06	.04½	.04½	.04½	250 lb bbls.....lb.	.04½	.06	.06	.04½
.03	.02½	.02½	.02½	Powdered, 350 lb bags.....lb.	.02½	.03	.03	.02½
.03½	.03½	3.75	3.75	Putty, commercial, tubs..100 lb.	.....	.03½	.03½	.03½
.05½	.05½	5.50	5.50	Linseed Oil, kegs.....100 lb.	.....	.05½	.05½	.05½
1.50	1.50	3.00	1.50	Pyridine, 50 gal drums.....gal.	.....	1.75	1.75	1.50
.13	.13	.13	.12	Pyrites, Spanish cif Atlantic ports bulk.....unit	.13	.13½	.13½	.13
.04	.03	.03	.03	Quebracho, 35% liquid tks....lb.	.03	.04	.04	.03
.04	.03½	.03½	.03½	450 lb bbls c-1.....lb.	.03½	.03½	.04½	.03½
.05	.04	.04	.04	35% Bleaching, 450 lb bbl .lb.	.04½	.05½	.04½	.05½
.05	.05	.05	.04½	Solid, 63%, 100 lb bales cif..lb.	.05	.05½	.05½	.05½
.05	.05	.05	.05	Clarified, 64%, bales.....lb.	.....	.05½	.05½	.05½
.06	.05½	.06½	.06½	Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.06	.05½
.13	.10	.10	.10	Solid, 100 lb boxes.....lb.	.10	.13	.13	.10
14.00	14.00	14.00	14.00	Bark, Rough.....ton	.....	14.00	14.00	14.00
35.00	34.00	34.00	34.00	Ground.....ton	34.00	35.00	35.00	34.00
.46	.45	.45	.45	R Salt, 250 lb bbls wks.....lb.	.44	.45	.46	.44
.....	.....	.18	.18	Red Sanders Wood, grd bbls..lb.	.....	.18	.18	.18
1.35	1.25	1.25	1.25	Resorcinol Tech, cans.....lb.	1.15	1.25	1.25	1.15
.57	.57	.67	.57	Rosin Oil, 50 gal bbls, first run .....gal.	.57	.58	.62	.57
.62	.62	72	.62	Second run.....gal.	.60	.61	.64	.60

Rosin

				Rosins 600 lb bbls 280 lb...unit				
9.75	8.20	13.00	8.50	B.....	.....	8.15	9.25	7.45
9.80	8.25	13.00	8.50	D.....	.....	8.15	9.25	7.70
9.95	8.60	13.15	8.50	E.....	.....	8.20	9.27	8.30
10.10	8.65	13.20	8.50	F.....	.....	8.25	9.27	8.40
10.10	8.75	13.25	8.50	G.....	.....	8.30	9.45	8.40
10.10	8.75	13.30	8.50	H.....	.....	8.30	9.50	8.40
10.15	8.80	13.35	8.55	I.....	.....	8.35	9.50	8.40
10.15	8.85	14.80	8.65	K.....	.....	8.55	9.55	8.45
10.30	8.85	15.00	8.80	M.....	.....	8.65	9.85	8.50
11.00	9.15	15.85	9.15	N.....	.....	9.00	10.30	8.93
11.65	10.15	16.60	10.50	WG.....	.....	9.35	11.30	9.00
12.65	10.40	18.55	12.00	WW.....	.....	9.95	12.30	9.30
30.00	24.00	24.00	24.00	Rotten Stone, bags mines....ton	24.00	30.00	30.00	24.00
.08	.07	.07	.07	Lump, imported, bbls.....lb.	.05	.07	.08	.05
.12	.09	.09	.09	Selected bbls.....lb.	.09	.12	.12	.09
.05	.02	.02	.02	Powdered, bbls.....lb.	.02	.05	.05	.02
.05	.04½	.04½	.04½	Sago Flour, 150 lb bags.....lb.	.04½	.05	.05	.04½
.....	.....	.90	.90	Sal Soda, bbls wks.....100 lb.	.....	1.00	1.00	1.00
20.00	19.00	19.00	19.00	Salt Cake, 94-96% c-1 wks. .ton	20.00	24.00	24.00	19.00
17.00	15.00	15.00	15.00	Chrome .....ton	20.00	21.00	21.00	12.00
.06½	.06½	.06½	.06½	Saltpetre, double refd granular 450-500 lb bbls.....lb.	.06½	.06½	.06½	.06½
.01½	.01½	.01½	.01½	Satin, White, 500 lb bbls.....lb	.....	.01½	.01½	.01½
.62½	.49	.66	.47	Shellac Bone dry bbls.....lb.	.....	.47	.61	.47
.55	.45	.57	.41	Garnet, bags.....lb.	.....	.40	.45	.40
.58	.47	.65	.40	Superfine, bags.....lb.	.....	.39	.47	.39
.55	.42	.37	.57	T. N. bags.....lb.	.....	.36	.44	.36
.57	.53	.50	.50	Schaeffer's Salt, kegs.....lb.	.53	.57	.57	.53
11.00	8.00	6.00	6.00	Silica, Crude, bulk mines....ton	8.00	11.00	11.00	8.00
30.00	22.00	15.00	15.00	Refined, floated bags.....ton	22.00	30.00	30.00	22.00
.....	.....	32.00	32.00	Air floated bags.....ton	.....	32.00	32.00	32.00
40.00	32.00	55.00	55.00	Extra floated bags.....ton	32.00	40.00	40.00	32.00
22.00	15.00	15.00	15.00	Soapstone, Powdered, bags f. o. b. mines.....ton	15.00	22.00	22.00	15.00

Soda

1.40	1.40	1.32½	1.32½	Soda Ash, 58% dense, bags c-1 wks.....100 lb.	.....	1.40	1.40	1.40
2.29	2.40	2.14	2.04	58% light, bags.....100 lb.	.....	1.34½	1.34½	1.34½
1.32½	1.32½	1.32½	1.32½	Contract, bags c-1 wks.100 lb.	.....	1.32	1.32	1.32
4.21	4.16	4.16	4.06	Soda Caustic, 76% grnd & flake drums.....100 lb.	.....	3.35	3.35	3.35
3.91	3.76	3.76	3.66	76% solid drs.....100 lb.	.....	2.95	2.95	2.95
3.00	3.00	3.00	3.00	Contract, c-1 wks.....100 lb.	.....	2.90	2.90	2.90
.05	.04½	.04½	.04½	Sodium Acetate, tech....450 lb. bbls wks.....lb.	.04½	.05½	.06½	.04½
.....	.....	.19	.18	Arsenate, drums.....lb.	.18	.19	.19	.18
.....	.....	1.00	1.00	Arsenite, drums.....gal.	.75	1.00	1.50	.75
2.41	2.41	2.41	2.41	Bicarb, 400 lb bbl NY..100 lb.	.....	2.41	2.41	2.41

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

the closing weeks of the month so that quotations are now at the same level as when last quoted with the market in fairly firm position. Conditions are fairly healthy and in commenting upon the situation, "The Chemist & Druggist" says that the market indicates consistent firmness, with a steady trade demand on both sides of the Atlantic; and current supplies throughout have been generally well absorbed from week to week, with available stocks occasionally encroached upon. But for adverse outside influences chiefly incidental to the panic in Wall Street, which has upset all important commodity markets, there is little doubt that turpentine prices would have advanced further. Owing to this disturbing factor, which was looked upon as likely to affect the outlet under fears of some deterioration in American industrial conditions, the general demand has obviously been more hesitating, but at no time has there been anything like real weakness. Offers of re-sale lots on the part of dealers or on speculative account have been steadily absorbed at the comparatively small declines recorded down to about 42s., which figure has been the lowest official quotation in the "open" market, and compares with 44s. 9d., the best recorded for several weeks before the Wall Street crisis. Fluctuations have more or less varied in sympathy with the trend of American cable advices, while the spot quotation at Savanah, which had advanced in the latter part of September up to about 51 cents per gallon, has since relapsed to below 50 cents. In the earlier part of October torrential rains fell in the producing districts, and this hampered operations over the tail-end of the season. This was reflected in a marked contraction in the receipts from the interior, and thus caused reserve stocks at southern distributing centres in the United States to be encroached upon to a notable extent. The present position of turpentine is doubtless disappointing to producers compared with the sharp burst of strength witnessed in November last year, when the price was lifted to well over 47s., although the consuming markets were then more liberally supplied than they are at present. Exports of gum spirits from the United States during November showed a decline to $1,313,368 from $1,445,111 during November of last year. Wood spirits were also lower at $64,122 from $87,035. For the first eleven months of 1929, however, gum spirits are ahead of last year's exports amounting to $7,771,560 as compared with $6,186,753 for the same period of last year. Wood turpentine lags behind with exports for the first eleven months valued at $397,088

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
.07	.06½	.06½	.06½	Bichromate, 500 lb cks wks.lb.	.07	.07½	.07½	.07
.04	.04	.08½	.08½	Bisulfite, 500 lb bbl wks....lb.	.....	.04	.04	.04
1.35	1.30	1.30	1.30	Carb. 350 lb bbls NY..100 lb.	1.30	1.35	1.35	1.30
.06½	.05½	.06½	.06½	Chlorate, ... wks..lb.	.07½	.08	.11	.06½
13.00	12.00	12.00	12.00	Chloride, technical.....ton	12.00	13.00	13.00	12.00
.20	.20	.20	.20	Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.18	.20	.20	.18
.09	.08½	.08½	.08½	Fluoride, 300 lb bbls wks...lb.	.08½	.09	.09	.08½
.24	.22	.22	.22	Hydrosulfite, 200 lb bbls f. o. b. wks.....lb.	.22	.24	.24	.22
.05	.05	.05	.05	Hypochloride solution, 100 lb cbys.....lb.	.....	.05	.05	.05
3.05	2.65	2.65	2.65	Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.50	3.00	3.05	2.50
2.65	2.40	2.40	2.40	Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.65	2.40
.45	.45	.70	.45	Metanilate, 150 lb bbls.... lb.	.....	.45	.45	.45
.....	.....	.02½	.02½	Monohydrate, bbls.....lb.	.....	.02½	.02½	.02½
57	.55	.55	.55	Naphthionate, 300 lb bbl...lb.	.54	.57	.57	.54
2.45	2.12½	2.67	2.25	Nitrate, 92%, crude, 200 lb bags c-1 NY.....100 lb.	2.13	2.22½	2.22½	2.09
.08½	.07½	.08½	.08	Nitrite, 500 lb bbls spot....lb.	.07½	.08	.08	.07½
.27	.25	.25	.25	Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.27	.25
.23	.20	.20	.20	Oxalate Neut, 100 lb kegs..lb.	.37	.42	.42	.37
.22	.21	.21	.21	Perborate, 275 lb bbls.....lb.	.18	.20	.22	.18
3.55	3.25	3.25	3.25	Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	3.25	3.55	3.55	3.25
.....	.....	.....	.....	tri-sodium, tech, 325 lb bbls.....100 lb.	3.90	4.00	4.00	3.90
.72	.69	.69	.69	Picramate, 100 lb kegs.....lb.	.69	.72	.72	.69
.12½	.12	.12	.11	Prussiate, Yellow, 350 lb bbl wks.....lb.	.12	.12½	.12½	.12
.14	.13½	.13½	.13½	Pyrophosphate, 100 lb keg..lb.	.15	.20	.20	.15
1.45	1.20	1.20	1.20	Silicate, 60 deg 55 gal drs, wks .....100 lb.	.....	1.65	1.65	1.65
1.10	.85	.85	.85	40 deg 55 gal drs, wks .....100 lb.	.70	.80	.80	.70
.05	.05	.04½	.04½	Silicofluoride, 450 lb bbls NY .....lb.	.05½	.05½	.05½	.05
.49	.48½	.48½	.48½	Stannate, 100 lb drums....lb.	.....	.38	.43	.38
.29	.18	.20	.20	Stearate, bbls.....lb.	.25	.29	.29	.25
.18	.16	.16	.16	Sulfanilate, 400 lb bbls.....lb.	.16	.18	.18	.16
.02½	.02½	.02½	.02½	Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02½	.02½	.02½	.02½
02½	.02½	.02½	.02½	Sulfide, 80% crystals, 440 lb bbls wks.....lb.	.02½	.02½	.02½	.02½
.04	.03½	.03½	03½	62% solid, 650 lb drums 1c-1 wks.....lb.	.03	.03½	.04	.03½
.03½	.03½	.03½	.03½	Sulfite, crystals, 400 lb bbls wks.....lb.	.03	.03½	.03½	.03
.50	.40	.40	.40	Sulfocyanide, bbls.....lb.	.28	.35	.76	.28½
.85	.80	.85	.80	Tungstate, tech, crystals, kegs .....lb.	.....	.88	1.40	.88
.40	.35	.40	.35	Solvent Naphtha, 110 gal drs wks.....gal.	.35	.40	.40	.35
.01½	.01½	.01½	.01½	Spruce, 25% liquid, bbls.....lb.	.....	.01½	.01½	.01½
.01	.01	.01	.01	25% liquid, tanks wks.....lb.	.....	.01	.01	.01
.02½	.02	.02	.02	50% powd, 100 lb bag wks lb.	.02	.02½	.02½	.02
4.42	3.07	3.22	3.07	Starch, powd., 140 lb bags .....100 lb.	3.82	4.02	4.12	3.82
4.32	2.97	3.12	2.97	Pearl, 140 lb bags.....100 lb.	3.72	3.92	4.02	3.72
.06½	.05½	.06	.04½	Potato, 200 lb bags.....lb.	.05½	.06½	.06½	.05½
.06½	.05½	.06½	.06½	Imported bags.....lb.	.05½	.06½	.06½	.05½
.08½	.08	.08	.06	Soluble.....lb.	.08	.08½	.08½	08
.10	.09½	.09½	.09	Rice, 200 lb bbls.....lb.	.09½	.10	.10	.09½
.07	.06½	.06½	.06½	Wheat, thick bags.....lb.	.06½	.07	.07	.06½
.10	.09½	.09½	.09½	Thin bags.....lb.	.09½	.10	.10	.09½
.07½	.07½	.07½	.07½	Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½	.07½
.09	.08½	.08½	.08	Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09½	.08½
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25	1.25

Sulfur

2.05	2.05	2.05	2.05	Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	2.05	2.05
19.00	18.00	18.00	18.00	Crude, f. o. b. mines.....ton	18.00	19.00	19.00	18.00
2.40	2.40	2.40	2.40	Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	2.40	2.40
2.50	2.50	2.50	2.50	Heavy bags c-1.....100 lb.	.....	2.50	2.50	2.50
3.45	3.45	3.45	3.45	Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.	.....	3.45	3.45	3.45
2.85	2.65	2.65	2.65	Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.85	2.65
.05½	.05	.05	.05	Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05½	.05
.04½	.03½	.03½	.03½	Yellow, 700 lb drs wks.....lb.	.03½	.04½	.04½	.03½
.08½	.08	.08	.08	Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.08½	.07
.19	.17	.17	.17	Extra, dry, 100 lb cyl.....lb.	.10	.12	.19	.10
.65	.10	.65	.65	Sulfuryl Chloride, 600 lb dr...lb.	.10	.65	.65	.10
15.00	12.00	12.00	12.00	Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	15.00	12.00
18.00	16.00	16.00	16.00	Refined, 100 lb bgs NY..ton	16.00	18.00	18.00	16.00
35.00	30.00	30.00	30.00	French, 220 lb bags NY...ton	18.00	22.00	25.00	18.00
45.00	38.00	38.00	38.00	Refined, white, bags....ton	35.00	40.00	45.00	35.00
50.00	40.00	40.00	40.00	Italian, 220 lb bags NY...ton	40.00	50.00	50.00	40.00
55.00	50.00	50.00	50.00	Refined, white, bags....ton	50.00	55.00	55.00	50.00
				Superphosphate, 16% bulk, wks.....ton	.....	9.50	10.00	9.00
5.10&10	4.65&10	4.85	4.00	Tankage Ground NY.....unit	.....	4.25&10	4.50&10	4.00&10
4.80&10	3.90&10	5.25	3.75	High grade f.o.b. Chicago.unit	.....	3.75&10	4.80&10	3.75&10
5.00&10	4.60&10	5.25	4.00	South American cif.....unit	.....	4.35&10	4.80&10	4.35&10
.05	.04½	.04½	.04½	Tapioca Flour, high grade bgs.lb.	.05½	.05½	.05½	.04½
.04	.03½	.03½	.03½	Medium grade, bags.....lb.	.04½	.04½	.04½	.03½
.27	.26	.26	.26	Tar Acid Oil, 15%,drums....gal.	.26	.27	.27	.26
.30	.29	.29	.29	25% drums.....gal.	.29	.30	.30	.29

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1928 $1.047 - Dec. 1929 $1.077

as compared with $473,614 for the same period of last year.

OILS AND FATS

Chinawood Oil — In common with most of the other oils, wood oil has not been very active during the past month. Buying has been very restricted as the wish is to limit inventories as much as possible. It is anticipated that buying activity will be renewed after the turn of the year as the prevailing low prices should be very attractive as soon as normal business is resumed. Coast tanks are at 12c lb., while the New York prices on both tanks and barrels are also lower, the former at 12¾c lb. and the latter at 14c lb. Total November exports from Hanow amounted to 3,214,000 pounds, of which 2,324,000 pounds went to the United States. This compares with total exports in October of 7,492,000 pounds, of which quantity, 5,238,000 pounds went to the United States. Total exports during November of last year amounted to 6,593,125 pounds, of which 3,845,765 pounds went to the United States. Total imports into the United States for eleven months of this year amount to practically the same as last year, 93,501,625 pounds as compared with 93,416,040 pounds for the same period of last year. Plans go forward for American production of this material. The American Tung Oil Co., Chicago, capitalized at $1,000,000 has just purchased a 10,000-acre tract near Bond, Miss., which it plans to develop and plant with tung oil trees.

Coconut Oil — The market has been fairly steady during the past month with practically no changes in prevailing quotations. There has been very little trading and but few offers from importers and refiners.

Corn Oil — Easier conditions in the grain market have lead to lower prices on this oil. Quotations on crude are now at 7¾c lb. in tanks and 9½c lb. in barrels. Refined oil is also lower at 9¼c lb. in tanks and 10c lb. in barrels.

Cottonseed Oil — Here, too, the tendency has been towards slackened activity and lower prices during the past month. The market has been steady and firm, but with an undoubted tendency downwards. Quotations have declined 4-5 points since last reported and crude oil is ¼c lb. lower in price.

Cottonseed crushed in the four-month period, Aug. 1 to Nov. 30, totaled 2,292,890 tons, compared with 2,270,507 tons for the same period a year ago, the Census Bureau announced. Cottonseed on hand at mills Nov. 30 totaled 1,159,195 tons, compared with 1,340,138 tons a year ago.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Terra Alba Amer. No. 1, bgs or bbls mills.....100lb.	1.15	1.75	1.15
1.75	1.15	1.15	1.15	No. 2 bags or bbls...100lb.	1.50	2.00	1.50
2.00	1.50	1.50	1.50	Imported bags.....lb.	.01½	.01½	.01½
.02½	.02	2.00	2.00	Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09
.....	.....	.....	.....	Tetralene, 50 gal drs wks.....lb.	.....	.20	.20
.20	.20	.20	.20	Thiocarbanilid, 170 lb bbl....lb.	.22	.24	.22
.24	.22	.22	.22	Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.13½	.13½
.17½	.14½	.20½	.17½	Crystals, 500 lb bbls wks...lb.	.33	.33½	.33
.41½	.36½	.48	.41½	Metal Straits NY.....lb.	.....	.39	.39
.58	.48	.71½	.58	Oxide, 300 lb bbls wks.....lb.	.....	.42	.42
.75	53	.75	.70	Tetrachloride, 100 lb drs wks.....lb.	.....	.27½	.27½
.35½	.30½	.48	.35½	Titanium Dioxide 300 lb bbl..lb	.22	.....	.22
.40	.40	.40	.40	Pigment, bbls.....lb.	.07½	.07½	.07½
.14	.13½	.13½	.13½	Toluene, 110 gal drs.....gal.	.....	.45	.45
.45	.40	.40	.40	8000 gal tank cars wks....gal.	.....	.40	.40
.45	.35	.35	.35	Toluidine, 350 lb bbls.....lb.	.90	.94	.90
.94	.90	.90	.90	Mixed, 900 lb drs wks.....lb.	.31	.32	.31
.32	.31	.31	.31	Toner Lithol, red, bbls.....lb.	.90	.95	.85
.90	.85	.85	.85	Para, red, bbls.....lb.	.....	.80	.70
.80	.70	.75	.75	Toluidine.....lb.	1.50	1.55	1.50
1.80	1.70	1.75	1.75	Triacetin, 50 gal drs wks.....lb.	.32	.36	.32
3.90	3.60	3.60	3.60	Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10
.....	.....	.....	.....	Triethanolamine, 50 gal drs...lb.	.55	.60	.55
.....	.....	.....	.....	Tricresyl Phosphate, drs.....lb.	.33	.45	.33
.50	.36	.36	.36	Triphenyl guanidine.....lb.	.58	.60	.58
.73	.69	.70	.69	Phosphate, drums.....lb.	.60	.70	.60
.75	.70	.70	.70	Tripoli, 500 lb bbls.....100 lb.	1.75	2.00	1.75
3.00	2.50	2.50	2.50	Turpentine Spirits, bbls.....gal.	.53	.59	.51½
.66½	.50½	.86	.53½	Wood Steam dist. bbls....gal.	.....	.50	.49
.59	.46	.76	.46	Urea, pure, 112 lb cases.....lb	.15	.17	.15
.20	.18	.18	.18	Fert. grade, bags c.i.f.....ton	.....	105.00	98.00
				c. i. f. S. points.....ton	.....	106.30	99.30
				Valonia Beard, 42%, tannin bags.....ton	.....	42.00	42.00
76.00	55.00	70.00	66.00	Cups, 30-31% tannin.....ton	.....	30.00	30.00
55.00	58.00	49.50	39.00	Mixture, bark, bags.....ton	.....	35.00	35.00
64.00	45.00	68.00	43.00	Vermillion, English, kegs....lb.	2.00	2.05	2.00
2.10	1.75	1.95	1.55	Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	1.00
.....	.....	.....	.....	Wattle Bark, bags.....ton	46.50	47.25	49.75
76.00	49.75	59.00	49.50	Extract 55%, double bags ex-dock.....lb.	.....	.06½	.06½
.06½	.05½	.05½	.05½	Whiting, 200 lb bags, c-1 wks.....100 lb.	.....	1.00	1.25
				Alba, bags c-1 NY.....ton	.....	13.00	13.00
1.25	1.25	1.25	1.25	Gilders, bags c-1 NY...100 lb.	.....	1.35	1.35
13.00	13.00	13.00	13.00				
1.35	1.35	1.35	1.35				

Zinc

				Zinc Ammonium Chloride powd., 400 lb bbls.....100 lb.	5.25	5.75	5.25
.05½	5.85	.06½	.06½	Carbonate Tech, bbls NY..lb.	.10½	.11	.10½
.10	.09½	.09½	.09½	Chloride Fused, 600 lb drs. wks.....lb.	.05½	.06	.05½
.06	.06	.06	.06	Gran., 500 lb bbls wks.....lb.	.06½	.06½	.06½
.06½	.06½	.06½	.06½	Soln 50%, tanks wks...100 lb.	.....	3.00	3.00
3.00	3.00	3.00	3.00	Cyanide, 100 lb drums.....lb.	.40	.41	.41
.41	.40	.40	.40	Dithiofuroate, 100 lb dr....lb.	.....	1.00	1.00
.09	.09	.09	.09	Dust, 500 lb bbls c-1 wks...lb.	.09½	11	.08¼
				Metal, high grade slabs c-1 NY.....100 lb.	.....	6 45	6.45
6.40	6.07½	7.35	6.40	Oxide, American bags wks..lb.	.07½	.07½	.07
.07¼	.07½	.07½	.07½	French, 300 lb bbls wks...lb.	.09½	.11½	.11½
.12½	.10½	.10½	.10½	Perborate, 100 lb drs.....lb.	.....	1.25	1.25
.....	.....	.....	.....	Peroxide, 100 lb drs.....lb.	.....	1.25	1.25
.....	.....	.....	.....	Stearate, 50 lb bbls.....lb.	.25	.26	.26
.....	.....	.....	.....	Sulfate, 400 bbl wks.....lb.	.03	.03½	.03¼
.03¼	.03½	.03½	.03	Sulfide, 500 lb bbls.....lb.	.30	.32	.32
.32	.30	.30	.30	Sulfocarbolate, 100 lb keg..lb.	.28	.30	.30
.30	.29	.29	.29	Xylene, 10 deg tanks wks...gal.	.....	.33	.33
.32	.32	.38	.32	Commercial, tanks wks...gal.	.30	.32	.32
.32	.30	.36	.30	Xylidine, crude.....lb.	.....	.38	.38
.38	.38	.35	.35	Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.03
.03	.02½	.02½	.02½	Pure kegs.....lb.	.45	.50	.50
.50	.45	.45	.45	Semi-refined kegs.....lb.	.08	.10	.10
.10	.08	.08½	.08				

Oils and Fats

.14½	.13	.14	.13	Castor, No. 1, 400 lb bbls.....lb.	.13	.13½	.13½
.14	.12½	.14	.12½	No. 3, 400 lb bbls.....lb.	.12½	.13	.13
.17	.14	.18	.17	Blown, 400 lb bbls.....lb.	.14	.15	.15
.17	.14½	.31	.13½	China Wood, bbls spot NY...lb.	.....	.14	.16
.14¾	.14¾	.18	.12½	Tanks, spot NY.....lb.	....	.12¾	.15
.14¼	.12¾	.....	.....	Coast, tanks, Nov.....lb.	.....	.12	.14½
.11½	.10¾	.12	.12	Cocoanut, edible, bbls NY....lb.	.....	.10¾	.10¾
.10	.09¾	.09¾	.09	Ceylon, 375 lb bbls NY....lb.	.....	.08¾	.09¾
.09	.08¾	.08¾	.08	8000 gal tanks NY.....lb.	.07	.07¾	.08¾
.10¾	.09¾	.10¾	.09¾	Cochin, 375 lb bbls NY....lb.	.08¾	.09¾	.10
.09¾	.08¾	.10	.08¾	Tanks NY.....lb.	.....	.08¾	.09¾
.10	.08¾	.09¾	.08¾	Manila, bbls NY.....lb.	.....	.08¾	.09¾
.08¾	.08	.08¾	.08¾	Tanks NY.....lb.	.07	.07¾	.08¾
.08¾	.07¾	.08¾	.08	Tanks, Pacific Coast.....lb.	.06¾	.07	.08

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average--$1.00 - Jan. 1927 $1.042 - Jan. 1829 $1.047 - Dec. 1929 $1.077

Cottonseed products manufactured during the four-month period and on hand Nov. 30 were: Crude oil produced 706,517,179 pounds, compared with 702,122,644, and on hand 124,022,306 pounds, compared with 141,906,240. Refined oil produced 532,099,951 pounds, compared with 513,443,454, and on hand 326,842,959 pounds, and compared with 322,567,918.

Linseed Oil — There has been but little activity in this market during the past month and all prices are two points lower than when last reported, with tanks at 13.8c lb., and barrels at 14.6c lb. Flaxseed prices declined during the closing weeks of the month which accounted in past for lower quotations on oil. The decline in seed was due to efforts to dispose of some of the holdings and stimulate buying. Final 1929 crop report of the Department of Agriculture gives fall production as 16,838,000 bushels, and the average yield per acre at 5.63. There have been shipped from Argentina in 1929 about 63,000,000 bushels, of which about 20,000,000 bushels came to the United States. It is thought about 4,000,000 bushels remain. Argentine exportable crop for 1930 is estimated from 48,000,000 to 50,000,000 bushels. At the moment, Argentine new crop, or February shipment, is quoted 24 cents a bushel less than November shipment, but the prospect of increased duty and the certainty of reduced by-product value, does not at the moment indicate much reduction in oil cost. This, of course, is based upon the assumption that demand returns to something more like normal after the turn of the year.

Perilla Oil — New crop, to be available about February-March, is now being quoted at 11½c lb. at the Coast. Supplies of the old crop are still available in barrels at 15½c lb.

Soy Bean Oil — Prices have gone much lower during the past month due to the fact that the market is in easy position because of accumulated stocks. Buying has been almost at a standstill and importers are carrying heavy stocks in anticipation of tariff changes. Tanks at the Coast are now at 9¼c lb., while the domestic price is at 9c lb. The latter material especially is not moving since its price is comparatively high at the prevailing quotations on imported oil. It is thought, however, that conditions will right themselves after the first of the year when buying again becomes active with consumers no longer interested in keeping down inventories and visible stocks.

1928 High	1928 Low	1927 High	1927 Low		Current Market	1929 High	1929 Low
				Cod, Newfoundland, 50 gal bbls			
.69	.63	.66	.63	.....gal.	.....	.54	.64	.57½
.63	.60	.59	.59	Tanks NY.....lb.	.....	.60	.60	.60
				Cod Liver see Chemicals.....				
.06½	.05½	.06	.06	Copra, bags.....lb.	.....	.044	.05½	.042
.11	.10	.11	.07	Corn, crude, bbls NY.....lb.	.....	.09½	.10½	.09½
.10	.08½	.09½	.07	Tanks, mills.....lb.	.....	.07½	.09½	.07½
.12½	.11½	.14	.10½	Refined, 375 lb bbls NY....lb.	.....	.10	.11½	.10½
.11½	.10½	.12	.11	Tanks.....lb.	.....	.09½	.11	.09
.09½	.07½	.09½	.06½	Cottonseed, crude, mill.....lb.	.....	.07½	.09	.08½
10.65	.09½	.11½	.08 1/5	PSY 100 lb bbls spot.....lb.	.....	.085	.1075	.085
10.75	.09½	.....	.....	Nov.—Jan.....lb.	.....	.088	.1080	.088
				Degras, American, 50 gal bbls				
.05	.04½	.04½	.04½	NY.....lb.	.03½	.04½	.05	.03½
.05½	.04½	.04½	do	English, brown, bbls NY....lb.	.04½	.05	.05½	.04½
.05½	.05½	.05½	.05½	Light, bbls NY.....lb.	.05	.05½	.05½	.05
				Greases				
.08½	.07	.07½	.06	Greases, Brown.....lb.	.....	.06½	.08½	.06
.08½	.07	.08	.06½	Yellow.....lb.	.....	.07½	.08½	.06½
.11	.09½	.10½	.08½	White, choice bbls NY.....lb.	.....	.08½	.11½	.07½
.42½	.40	.....	.....	Herring, Coast, Tanks.....gal.	.....	Nom.		
Nom.	.09½	.09½	.09	Horse, bbls.....lb.	.09½	Nom.	Nom.	.....
.16½	.15½	.16½	.14½	Lard Oil, edible, prime.....lb.	.....	.15½	.15½	.14½
.13½	.12	.13½	.10½	Extra, bbls.....lb.	.....	.12½	.13½	.12
.13	.11	.12½	.10½	Extra No. 1, bbls.....lb.	.....	.12	.13½	.11½
10.8	10.0	.11 4/5	.10 2/5	Linseed, Raw, five bbl lots...lb.	.....	.15	.162	.105
10.4	9.6	.11 9/10	.09 6/10	Bbls c-l spot.....lb.	.....	.146	.158	.101
9.6	8.8	.10½	.09	Tanks.....lb.	.....	.138	.15	.093
.09½	.09½	.09½	.09½	Lumbang, Coast.....lb.	.....	.09½	.09½	.09½
.48	.40	.47½	.44	Menhaden Tanks, Baltimore.gal.	.....	.50	.52	.45
.09	.09	.90	.10	Blown, bbls NY.....lb.	.....	.09	.09	.09
.70	.67	.70	.67	Extra, bleached, bbls NY..gal.	.....	.70	.70	.70
.64	.63	.66	.63	Ligh, pressed, bbls NY....gal.	.63	.64	.64	.63
.67	.66	.66	.69	Yellow, pressed, bbls NY..gal.	.66	67	.67	.66
				Mineral Oil, white, 50 gal bbls				
.60	.40	.....	.....	.....gal.	.40	.60	.60	.40
1.00	.95	.....	.....	Russian, gal.....gal.	.95	1.00	1.00	.95
.19	.18½	.18½	.14½	Neatsfoot, CT, 20° bbls NY .lb.	.....	.18½	.19	.18½
.13½	.12	.13½	.10½	Extra, bbls NY.....lb	.....	.12½	.13½	.12
.16½	.15½	.16½	.12½	Pure, bbls NY.....lb.	.....	.14½	.15½	.13½
.17½	.11½	.18½	.10	Oleo, No. 1, bbls NY.....lb.	.....	.11½	.11½	.10½
.15½	.11	.17	.08½	No. 2, bbls NY.....lb.	.....	.10½	.11½	.10
.14	.10	.14	.08½	No. 3, bbls NY.....lb.	.....	.10	.10½	.09½
1.40	1.18	1.75	1.40	Olive, denatured, bbls NY...gal.	1.05	1.15	1.40	1.05
2.00	1.75	2.00	2.45	Edible, bbls NY.....gal.	1.95	2.00	2.00	1.95
.11	.09½	.10½	.08½	Foots, bbls NY.....lb.	.08½	.08½	.11½	.08½
.09½	.08½	.09½	.09	Palm, Kernel, Casks.....lb.	.....	.08½	.09	.08
.09½	.07½	.08½	.07½	Lagos, 1500 lb casks.....lb.	.....	.07½	.09	.07½
.08½	.07	.08½	.07½	Niger, Casks.....lb.	.....	.07½	.08½	.07
.12½	.12	.14½	.12	Peanut, crude, bbls NY.....lb.	.....	Nom.	Nom.	.....
.17	.14½	.15½	.14½	Refined, bbls NY.....lb.	.14½	15	.15	.14½
.21	.13	.16½	.12½	Perilla, bbls NY.....lb.	.....	.15½	.20	.15
.15½	.10½	.14½	.10	Tanks, Coast.....lb.	.....	.11½	.15½	.13
1.75	1.70	1.70	1.70	Poppyseed, bbls NY.....gal.	1.70	1.75	1.75	1.70
1.06	1.01	1.05	1.00	Rapeseed, blown, bbls NY...gal.	1.04	1.04	1.04	1.04
.92	.83	.90	.82	English, drms. NY.....gal.	.....	.82	.90	.82
.90	.81	.85	.76	Japanese, drms. NY.....gal.	.....	.72	.88	.72
.10½	.09½	.10	.09	Red, Distilled, bbls.....lb.	.10½	.11½	.11½	.10½
.09½	.08	.09½	.08½	Tanks.....lb.	.....	.09½	.10½	.09½
.50	.42	.50	.50	Salmon, Coast, 8000 gal tks..gal.	.42	.44	.44	.42
.50	.41	.47	.43	Sardine, Pacific Coast tks...gal.	.....	.47	.51	.45
.13½	.12	.13	.11½	Sesame, edible, yellow, dos...lb.	.11½	.12	.12	.11½
.15	.12½	.14	.14	White, dos.....lb.	.12½	.12½	.12½	.12½
.40	.40½	.40	.40	Sod, bbls NY.....gal..	.....	.40	.40	.40
.....	.....	.09½	.09½	Soy Bean, crude.....				
.09½	.09	.....	.....	Pacific Coast, tanks.....lb.	.....	.09½	.10½	.09
				Domestic tanks, f.o.b. mills, ...lb.	.....	.09	.10½	.08½
.12½	.12	.12½	.10½	Crude, bbls NY.....lb.	.....	.11½	.12½	.11¼
.10½	.10½	.11	.10½	Tanks NY.....lb.	.....	.10½	.11½	.10½
.13½	.13½	.13	.12	Refined, bbls NY.....lb.	.13½	.13½	.13½	.13½
				Sperm, 38° CT, bleached, bbls				
.85	.84	.85	.84	NY.....gal.	.84	.85	.85	.84
.80	.79	.82	.79	45° CT, bleached, bbls NY gal.	.79	.80	.80	.79
.18½	.11	.13½	.11½	Stearic Acid, double pressed dist bags.....lb.	.15½	.16½	.18½	.15½
				Double pressed saponified bags .....lb.	.16½	.16½	.19	.15½
.19	.11½	.14	.11½	Triple, pressed dist bags..lb	.18½	.18½	20½	.17½
.20½	.13½	.15½	.13½	Stearine, Oleo, bbls.....lb.	.10½	.10½	.12	.09½
.12½	.09½	.13	.08½	Tallow City, extra loose.....lb.	.....	.07½	.08½	.07
.09½	.08½	.09	.07½	Edible, tierces.....lb.	.09	.09½	.10½	.08
.10½	.09½	.11	.08½	Tallow Oil, Bbls, c-1 NY...lb.	.....	.11	.12	.10½
.12½	.11½	.10½	.08½	Acidless, tanks NY.....lb.	.....	.10	.11	.09½
.11½	.10½	.12½	.10	Vegetable, Coast mats.....lb.	.08	Nom.	Nom.	.08
Nom.	.08	.08½	.07½	Turkey Red, single bbls.....lb.	.11	.12	.12	.11
.11	.....	.11	.11	Double, bbls.....lb.	.14	.16	.16	.14
.16	.14	.14	.14	Whale, bleached winter, bbls				
				NY.....gal.	.....	.74	.80	.74
.80	.78	.78	.78	Extra, bleached, bbls NY..gal.	.....	.76	.82	.76
.82	.80	.80	.80	Nat. winter, bbls NY.....gal.	.....	.73	.78	.73
.78	.76	.76	.76					

Index To Advertisers

"WE"—Editorially Speaking

If we are a bit late in reaching you this month we can only plead exemption under that clause which reads "fire, flood, or other act of God beyond our control." But we feel, and we think that you will agree with us, that the international symposium which we present in our pages this month was well worth waiting for.

Our distinguished contemporaries—Mr. M. D. Curwen, editor of the *Industrial Chemist*, London; Dr. J. H. Frydlender, associate editor, *Revue des Produits Chimiques*, Paris; Dr. Walter Roth, editor, *Chemiker Zeitung*, Kothen, Germany; and Dr. Massimo Treves, director of *L'Industria Chimica*, Rome—have cooperated with us so that we are able to present a comprehensive survey on an international scale of the past year's contributions to chemical industry in the principle chemical producing centers of the world.

The results of this international symposium remind us of the elephant story. Not *that* elephant story. It seems that an English publisher wanted to publish the most complete and authorative set of works possible on the subject of the elephant. He held a meeting in London to which he invited the world's five most distinguished authorities—an American an Englishman, a Frenchman, a German and an Italian. He told them what he wanted, advised them to spare neither time nor expense but to write their masterpiece on the elephant.

The Englishman bought a new big-game hunting outfit, went to equatorial Africa, hired himself beaters, guides and porters, spent two years in the brush, returned and re-wrote from his hunting diary, a book which he called "Elephant Tracks."

The Frenchman went to the Zoological Garden in Paris, and held long, intimate conversation with all the keepers. He turned out a lively manuscript entitled, "Les Amours des Elephants."

The German made a grand tour of the libraries on the Continent, gathered a trunkload of notes, retired in seclusion with them for five years, at the end of which time he submitted for publication an enormous volume with this modest title, "A Brief Introduction into the Psychology and the Physiology of the Elephant, Volume One." The Italian took unto himself a cask of red wine, retired to a castle in Tuscany, and produced a thin volume on "The Elephant and the Adriatic Problem."

The American boarded the fastest steamer to New York, chartered an airplane to Florida where he interviewed John Ringling at the winter quarters of his famous circus, flew back to New York, jumped on another fast steamer, and arrived in London within three weeks with his contribution, "Bigger and Better Elephants."

A somewhat different, and almost unconsidered angle of the proper relation of synthetic chemical manufacture to manufacture from a natural raw material is brought out in the article, "Natural vs. Synthetic." The idea expounded in this article is graphically driven home by the superimposed pictures on the first page. They tell a story of efficiency vs. inefficiency, which, as is pointed out in the article, has been the primary cause for what triumphs have been scored by synthetic production over older natural manufacturing methods. The picture of the Dow indigo plant is from a painting by A. H. K. Hammond.

For those who have been following the installments of "Chemical Backgrounds" as they have appeared in these pages, we wish to announce that it was impossible to include the third and concluding installment in our pages this month due to lack of space. In consequence it will appear in our February issue.

COMING FEATURES

LORD MELCHETT

discusses the goal of modern industry. Larger units, workers as shareholders, and the human side of industry are discussed by the chairman of Imperial Chemical Industries.

ANALYZING CHEMICAL MERGERS

Willard L. Thorp writes of the merger tendency of the past year in the light of the chemical industry's past merger history.

DOES THE CHEMICAL JOBBER LOWER DISTRIBUTION COSTS

Charles W. Brown, Manager, Chicago branch, Innis, Speiden & Co., advocates the cause of the chemical dealer in terms of lower costs.

SOLVENTS

William L. Holter, eastern sales manager, Van Schaak Bros. Chemical Works, discusses the various ramifications attending upon the present-day manufacture and sale of solvents.